BBC wildlife

DECEMBER
2025
Issue 13 Vol 43

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**WILDLIFE ARTIST OF THE YEAR**
WINNERS

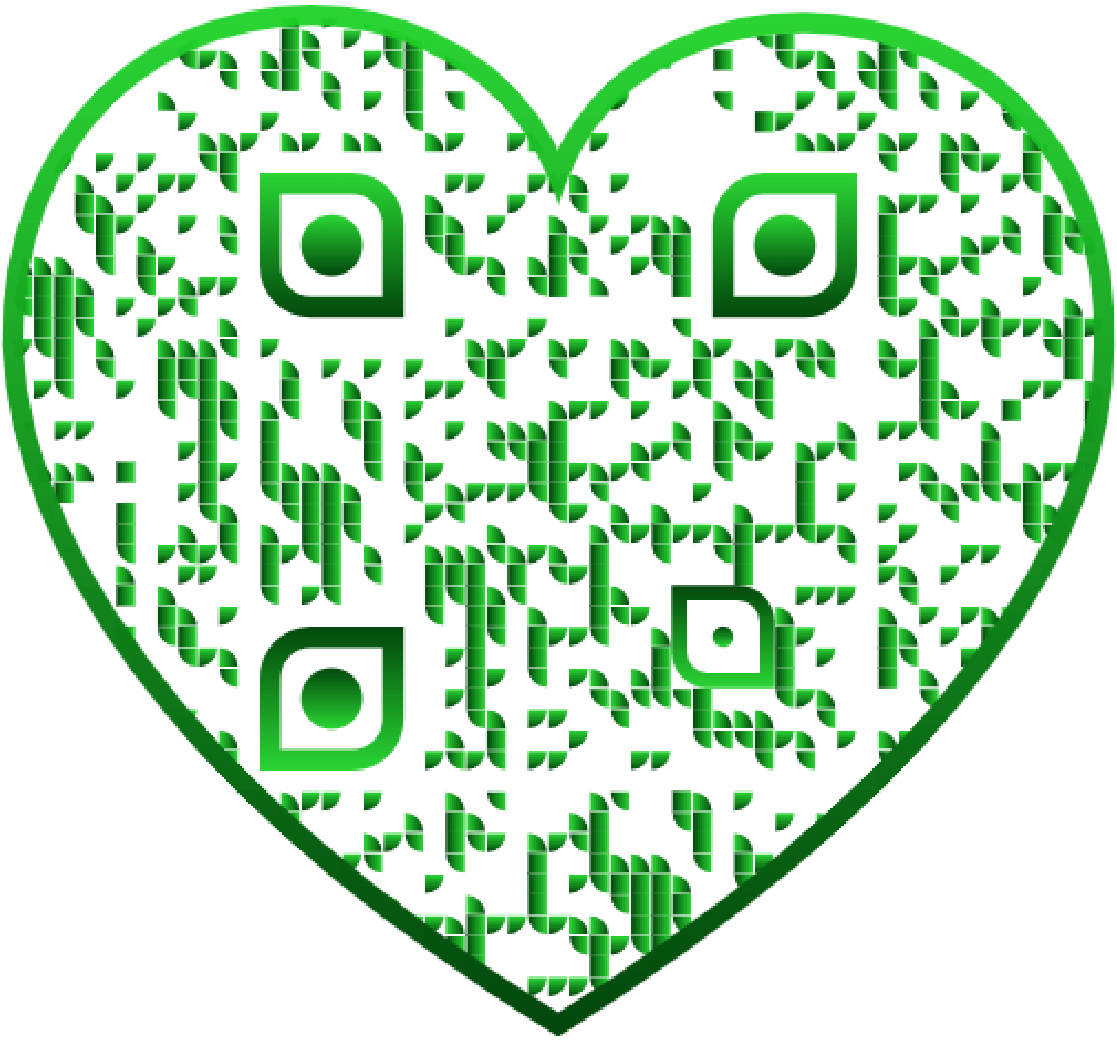
Saving India's king cobras

Beach monkeys in Kenya

Remembering Jane Goodall

# BIG FOOT

A mission through the Rocky Mountains in search of the elusive snowshoe hare



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## ON THE BBC THIS MONTH

Coconut crab

### Curious Cases

Hannah Fry and Dara Ó Briain kick off the latest series of this science programme by pondering if the crab is truly the ultimate life-form. From coconut to spider, they learn how to tell 'true' crabs from impostors.
*Catch up on BBC Sounds*

Hamza Yassin

### Hamza's Hidden Wild Isles

This four-part series sees wildlife cameraman Hamza Yassin spend a year travelling around the British Isles to track down elusive species using the latest drone, thermal and macro technology.
*Catch up on BBC iPlayer*

### A Carnival of Animals

From Picasso's owl to myths about hedgehogs, in this series author Katherine Rundell explores the astonishing stories of 20 endangered animals – a joyful tribute to what we have, and a timely warning of what we stand to lose.
*Catch up on BBC Sounds*

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COCONUT CRAB: GARY ROBERTS/ALAMY; HAMZA YASSIN: NEIL GENOWER/SIDNEY STREET PRODUCTIONS/BBC; SNOWSHOE HARE: DEENA SVEINSSON

With its pure white winter coat, the snowshoe hare is a master of camouflage

# When a picture paints a thousand words

**PAUL McGUINNESS, EDITOR**

Some animals seem to affect us more than others. It's why as children we ask each other which are our favourites. Well, as from this issue, I have a new favourite (or top 10 entry at least): the wonderfully named snowshoe hare, so perfectly captured in Deena Sveinsson's cover image and feature this month (*p38*).

But what is it about this creature that connects with me so deeply? Is it the softness of the fur, so tactile in Deena's pictures? Or maybe the cartoon-like thumping feet from which it takes its name? Perhaps it's just that adorable face?

I find myself wondering what it must be like to be a snowshoe hare, projecting my own consciousness onto a wild animal, regardless of how futile I know such an exercise is. But mostly I just gaze at it and wish that, like Deena, I could look at it every day, year after year.

I hope you enjoy it as much as I do!

Paul

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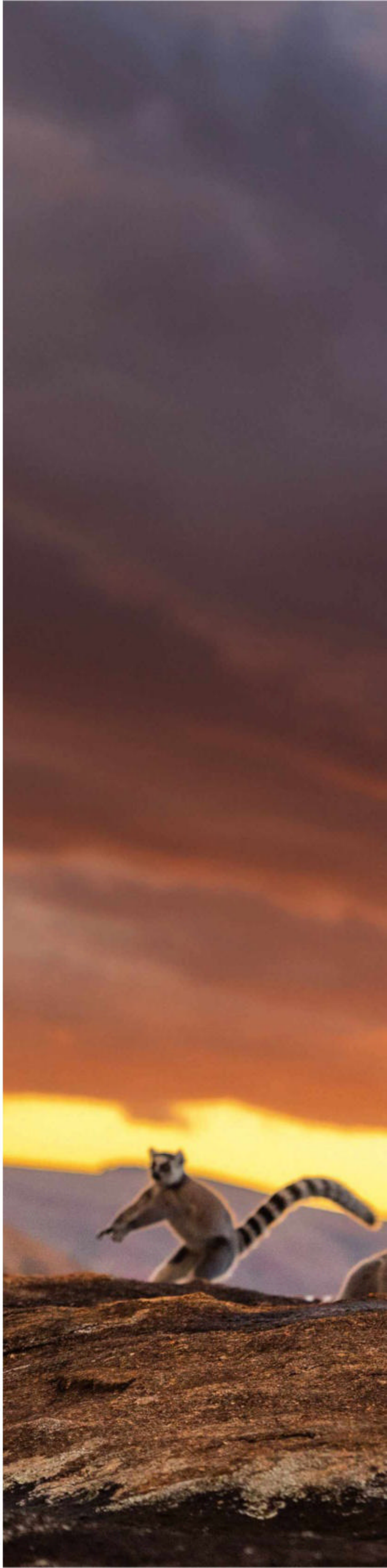

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# Dec.

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## THE COVER

Our cover star is a snowshoe hare, photographed by Deena Sveinsson in the Colorado Rocky Mountains. Deena endured months of sub-zero temperatures to capture this striking image, part of her wonderful portfolio on page 38.

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Life with monkeys in coastal Kenya

PETER'S ANGOLA COLOBUS MONKEY: ROLAND SEITRE/NATUREPL.COM; KING COBRA: LUCA EBERLE; MAGNIFICENT FRIGATEBIRD: DAVID FLEETHAM/NATUREPL.COM; BRAMBLINGS: DAVID KJAER/NATUREPL.COM

## Every month, only in *BBC Wildlife*

**NICK BAKER**
"Weevil watching is made more challenging by the extreme sensitivity of these insects to disturbance" ***p28***

**KATE BRADBURY**
"The gradual lengthening of days is the little bit of hope we all need at this time of year, isn't it?" ***p21***

**MIKE DILGER**
"The dun-coloured puma is a master of camouflage in environments typical of Patagonia" ***p24***

**DAVID LINDO**
"Serbian ornithologist Milan Ružić realised that large numbers of long-eared owls were roosting in urban areas of Serbia" ***p23***

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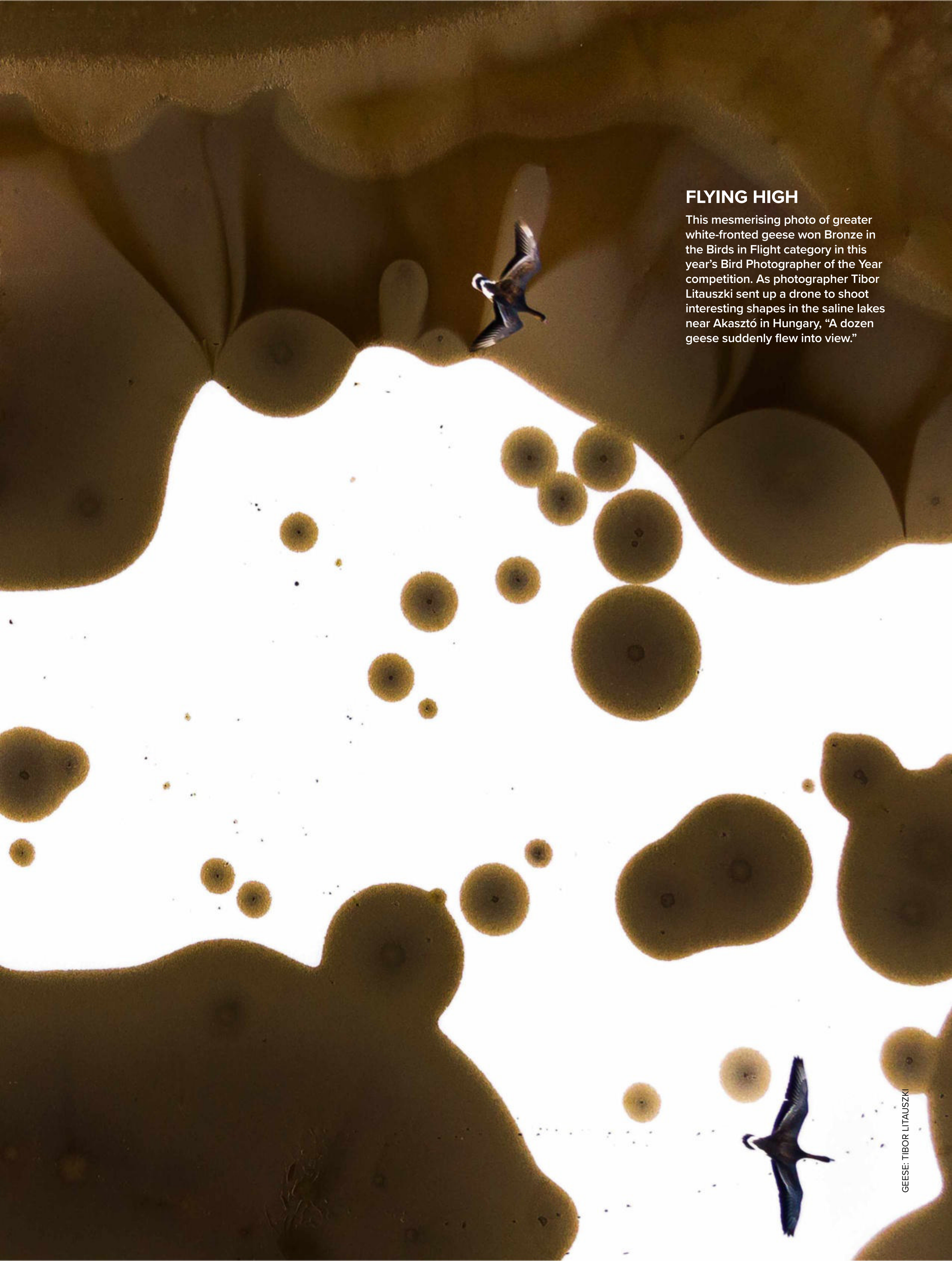
# wild TIMES

The latest news, photography and seasonal wildlife highlights



## FLYING HIGH

This mesmerising photo of greater white-fronted geese won Bronze in the Birds in Flight category in this year's Bird Photographer of the Year competition. As photographer Tibor Litauszki sent up a drone to shoot interesting shapes in the saline lakes near Akasztó in Hungary, "A dozen geese suddenly flew into view."

GEESE: TIBOR LITAUSZKI

# Oceanic manta rays dive deep to navigate

## Research reveals world's largest rays go hundreds of metres below the surface to get their bearings

OCEANIC MANTA RAYS – THE largest species of ray – may dive more than 1,200 metres deep to navigate the ocean, according to a new study published in the journal *Frontiers in Marine Science*.

Scientists tagged 24 mantas in Raja Ampat, Indonesia; Tumbes, Peru; and near Whangaroa, New Zealand, then reviewed the data. They noticed that the rays were more likely to dive extremely deep off the coast of New Zealand: of the 2,705 tag-days of data collected, mantas dived to more than 500m on 79 days – 71 of these dives were around New Zealand.

"Far offshore, oceanic manta rays are capable of diving to depths greater than 1,200 metres, far deeper than previously thought," says Calvin Beale from Murdoch University in Perth, Australia, one of the study authors.

The rays' diving patterns offered a clue to explain the behaviour. The rays in New Zealand typically did a huge dive the day after entering deeper waters off the continental shelf. They swam sharply down but didn't spend time at these depths, suggesting they weren't feeding or evading predators. After returning to the surface, some swam more than 190km in the following days.

One reason to dip so far below the surface could be that the mantas are picking up signals about where they are, such as changes in the Earth's magnetic field, or in oxygen, temperature and light levels.

"These dives, which are linked with increased horizontal travel, may play an important role in helping mantas gather information about their environment," says Beale. "By diving and 'sampling' these signals, they could build a mental map that helps them navigate across vast, featureless stretches of open ocean." In deeper waters, these clues can be more stable and predictable than at the surface, the scientists say.

More research is needed, but the study "reminds us that the deep ocean – which regulates Earth's climate – remains poorly understood but vitally important," says Beale.

**Melissa Hobson**

Oceanic manta rays have an average disc width of 4-5m, with the largest almost 7m

MANTA RAY: GUY STEVENS/MANTA TRUST

# Birds follow the flames

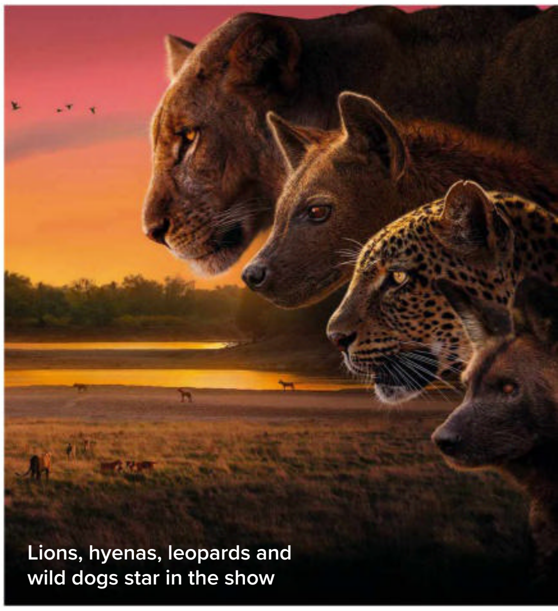
## In the Sierra Nevada of California, fire gives some birds a boost

FIRES IN THE WILD ARE GENERALLY FEARED among humans, for good reason. But they are crucial to the functioning of many ecosystems, from prairies to forests. Now, a new study published in the journal *Fire Ecology* finds that some birds benefitted from blazes over a 35-year period in Yosemite, Sequoia and Kings Canyon National Parks in the Sierra Nevada region of the USA. Of the 42 species studied, 28 showed increased population densities for several decades in regions that had burned. And it wasn't only known post-fire specialists that reaped the rewards – generalist species, such as dark-eyed juncos and mountain chickadees, benefitted, too.

"Given the effects of fire on bird habitats, and the long post-fire process of vegetative succession, maybe it's not too surprising that birds are responding to fires for so long afterwards," says lead author Chris Ray, from The Institute for Bird Populations. Fires damage large trees, allowing for a greater range of plants to emerge. These post-fire ecosystems offer birds a varied diet and a wealth of nesting sites. "Western tanagers and hermit warblers were more abundant at points that had experienced a low-severity burn 35 years ago than at points that never burned in the previous 35 years," adds Ray.

About 97.5 per cent of the study locations were in areas that had experienced burns of low to moderate severity, so the results are likely not applicable to regions that have seen severe wildfire damage in recent decades – attributed in part to poor forest management and increasingly extreme weather events. It underscores the importance of fire regimes. Both managed burns and natural burns are needed to maintain ecosystems in a human-dominated world. Indigenous peoples once set fires or allowed lightning strikes to ignite their lands because they reaped the benefits. Suppressing fire is instinctive and natural too. But as the abundance of birds in these Sierra Nevada parks indicates, the terrifying and destructive power of fire is key to the natural order. **Richard Pallardy**

The hermit warbler benefits from forest regrowth after a fire, as there are more insects



Lions, hyenas, leopards and wild dogs star in the show

# Attenborough narrates new wildlife series

## BBC's *Kingdom* chronicles four animal families

Filmed in one spectacular location over five years, the new BBC television series *Kingdom* documents four African animal family units in a remote Zambian river valley as they wrestle for power within their own groups – and across their habitat.

The six-part series begins on BBC One in November and will also be available on iPlayer. It follows the lives of leopards, hyenas, wild dogs and lions, and looks at how these top predators are impacted by other species – from elephants to dung beetles – in surprising ways.

Scientists also reveal records of these animals' ancient rivalries and internal battles for hierarchy that stretch back more than 20 years, uncovering knowledge that may lead to further protection of these species.

With more time spent filming in the field than any previous BBC Studios Natural History Unit (NHU) production, and narrated by David Attenborough, *Kingdom* showcases the dramatic real-life sagas of these impressive predators. "Being given access to film in this part of Zambia for such a concentrated period of time is a dream come true for the NHU," says Mike Gunton, executive producer and BBC Studios NHU creative director. "All we can predict is that it will be unpredictable... but exciting, too."

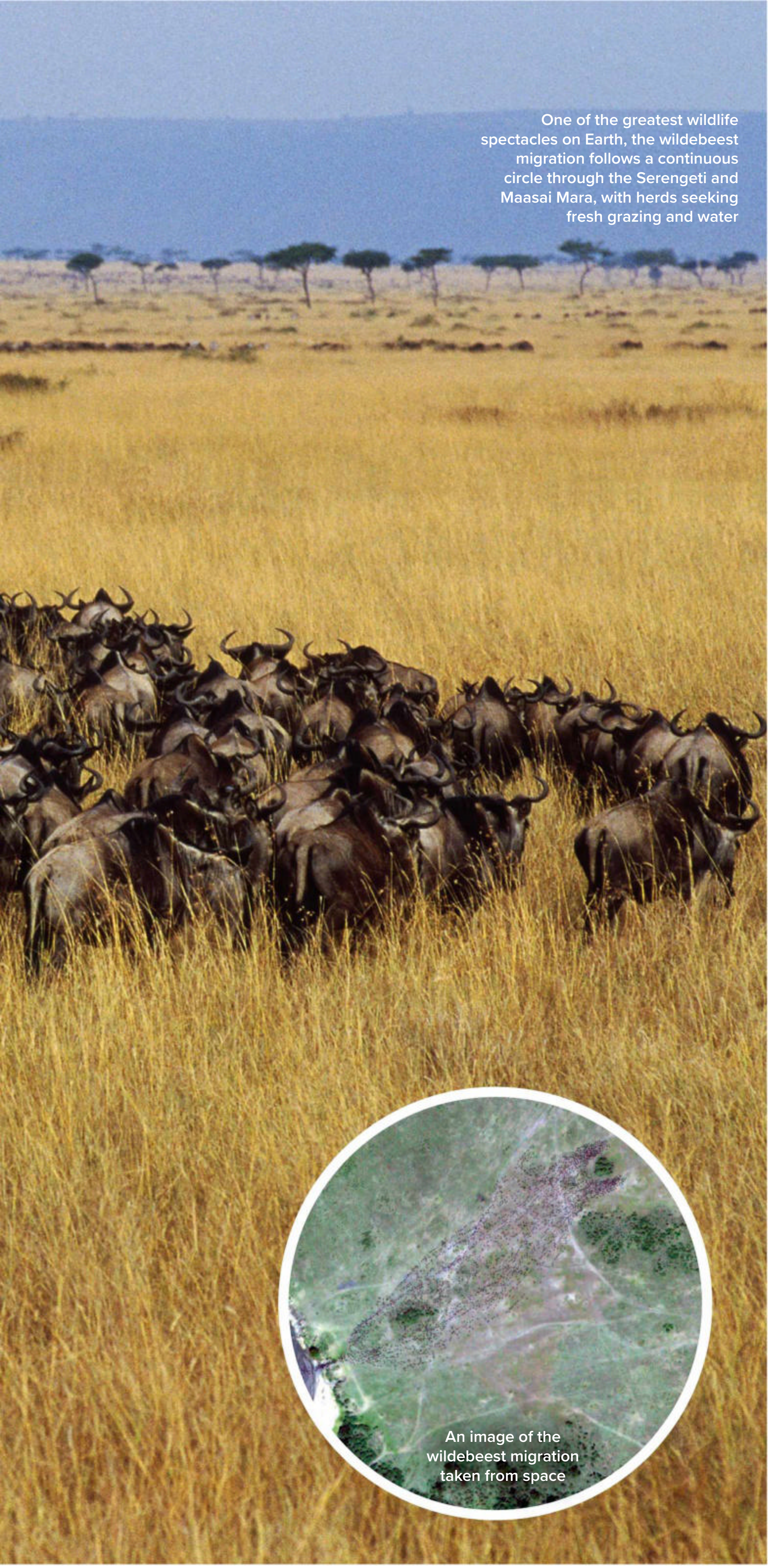
**Sophie Ellis**

HERMIT WARBLER: FRANK D LOSPALLUTO; KINGDOM: BBC STUDIOS

# wild TIMES

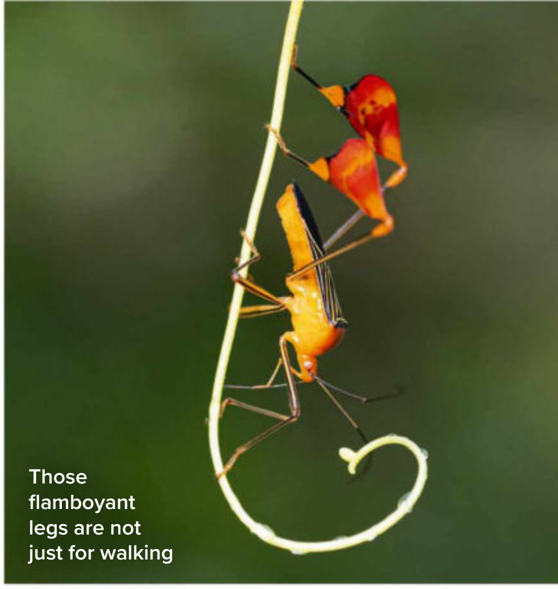
## WILDEBEEST COUNT

East Africa's great wildebeest migration is less than half the size previously estimated, a new study suggests. Using satellite imagery and AI, scientists at the University of Oxford counted fewer than 600,000 animals. The more accurate figure will help experts monitor and conserve the species, which sustains predators such as lions and crocodiles.



One of the greatest wildlife spectacles on Earth, the wildebeest migration follows a continuous circle through the Serengeti and Maasai Mara, with herds seeking fresh grazing and water

An image of the wildebeest migration taken from space



Those flamboyant legs are not just for walking

# Rolling out the red flags

## Leg-waving display of the matador bug explained

Deep in the rainforests of Panama lives a colourful animal with quite the party trick. The matador bug (*Bitta alipes*), a small, leaf-footed insect, has elaborate hind legs adorned with vivid red 'flags' that it raises into the air and waves in a striking display.

For a long time, scientists assumed this flamboyant performance was part of the bug's courtship ritual. But a new study, published in *Current Zoology*, suggests it may instead be a highly effective defence mechanism to ward off predators.

To test the anti-predator theory, researchers at the Smithsonian Tropical Research Institute in Panama City collected matador bugs from the town of Gamboa in Panama and placed them in the presence of predatory praying mantids and harmless katydids to see how they would react.

During the experiment, they recorded 25 individuals performing 2,938 leg waves. On average, matador bugs waved their legs seven times more often when mantids were nearby, while showing little reaction to katydids. The scientists also noticed that the predatory mantids never attacked bugs that were actively waving. This suggests the waving display is triggered specifically by danger.

Observations of related insects in Panama, combined with analysis of online footage, revealed that at least five other species in the same family perform 'flag'-waving, pointing to a wider evolutionary pattern. All these insects feed on passion-flower vines, which are known to carry toxins – the researchers suggest the waving could be a warning of their toxicity. Another theory is that the waving might confuse predators' vision and disrupt an attack. **Daniel Graham**

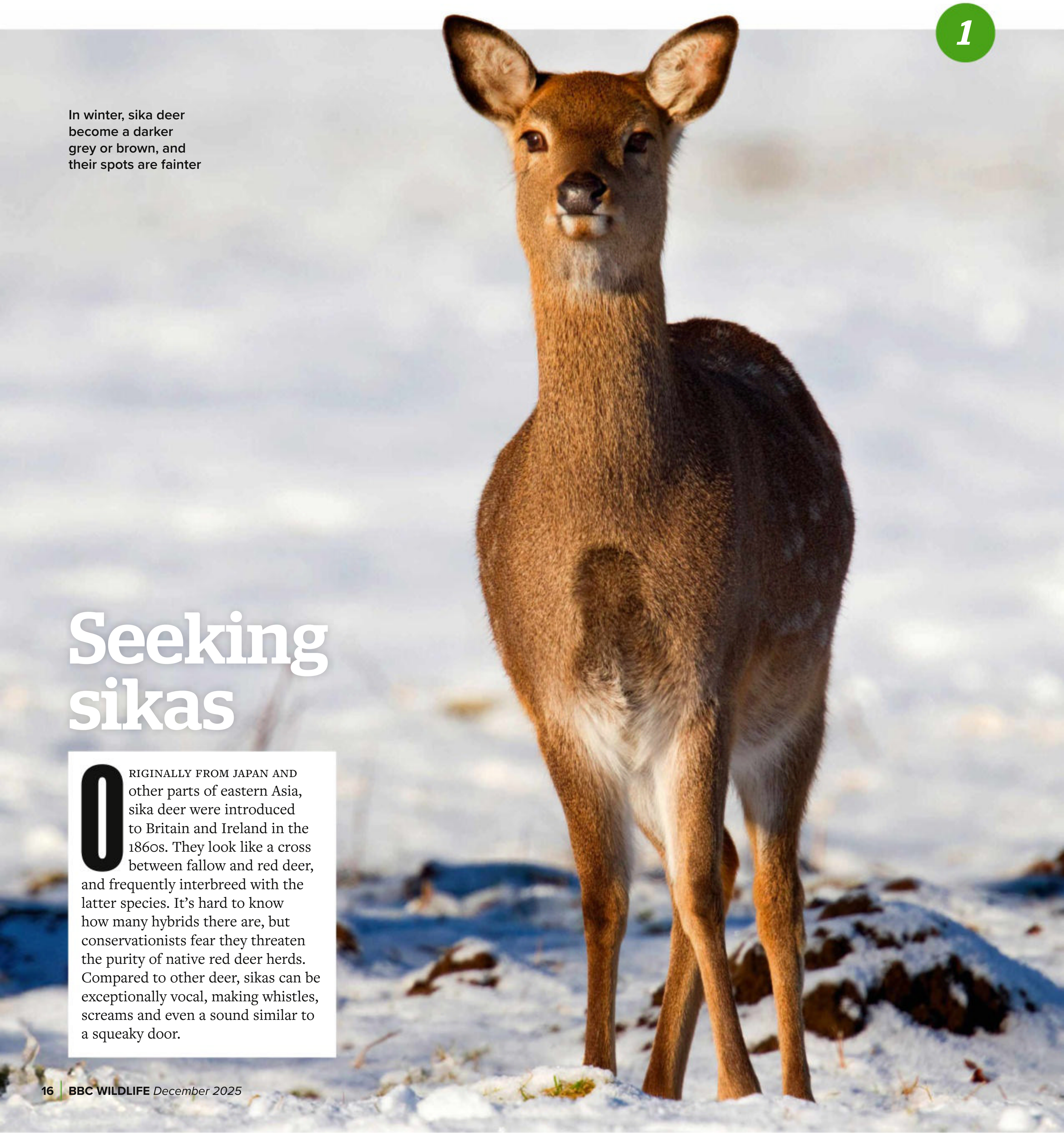
WILDEBEEST MIGRATION: GERRY ELLIS/NATUREPL.COM; WORLDVIEW-3 SATELLITE IMAGE: MAXAR TECHNOLOGIES/TIEJUN WANG; MATADOR BUG: STEVEN PATON

# wild DECEMBER

## 7 nature encounters for the month ahead

WITH NATURALIST AND AUTHOR BEN HOARE

1



In winter, sika deer become a darker grey or brown, and their spots are fainter

## Seeking sikas

Originally from Japan and other parts of eastern Asia, sika deer were introduced to Britain and Ireland in the 1860s. They look like a cross between fallow and red deer, and frequently interbreed with the latter species. It's hard to know how many hybrids there are, but conservationists fear they threaten the purity of native red deer herds. Compared to other deer, sikas can be exceptionally vocal, making whistles, screams and even a sound similar to a squeaky door.

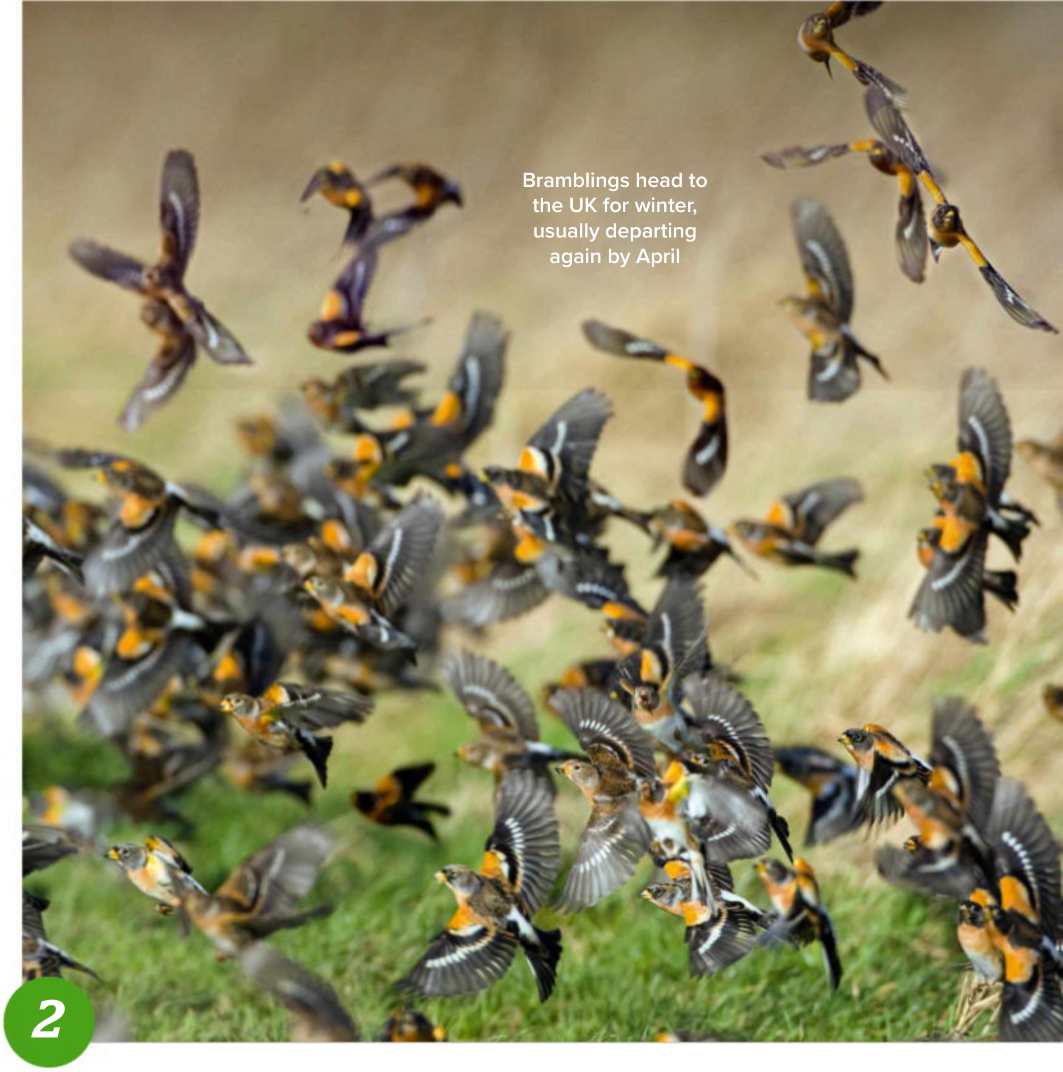
2

# Finch flocks

Bramblings are the northern counterpart of chaffinches, which they closely resemble in both shape and size. Breeding mainly in the huge birch forests of Scandinavia, the Baltic and Russia, they pour south every autumn to avoid the winter.

Most of these migratory finches head to central and southern Europe, where they occasionally gather in vast blizzard-like flocks of several million birds, the biggest of any bird species ever recorded on the continent. But they also visit Britain. Numbers vary, with more bramblings turning up in years when supplies of beech mast are scarce in mainland Europe – the seeds inside these prickly nuts are one of their favourite winter foods.

Bramblings and chaffinches feed the same way, scouring leaf litter and farmland stubble for fallen seeds, often in mixed flocks. The northern visitors have a bright orange area on the chest and 'shoulders', but sometimes the easiest way to tell them apart is by looking for the bright white flash of their rumps whenever they take off.



Bramblings head to the UK for winter, usually departing again by April

3

# Sticky situation

Long before kissing under the mistletoe at Christmas became popular during the 1700s, this unusual plant featured in many of our folk stories. It's easy to see why: its leaves remain green throughout the year, even in winter, when the deciduous trees on which it lives lose theirs. Green mistletoe looks wonderfully lush in the bare December treetops – so how does the plant do it? It's actually a parasite – or, strictly speaking, a part-time parasite (or hemiparasite). It can make sugars by photosynthesis, and supplements this with nutrients stolen from its host tree.

Mistletoe produces white berries poisonous to us, as well as to horses, but that blackbirds, mistle thrushes and blackcaps love. These birds are unable to digest the waxy seeds, so scatter them intact in their droppings. Because the seeds are extremely gooey, they end up sticking to branches, enabling the mistletoe to get a foothold and spread from tree to tree.

Common host trees for mistletoe include apple trees and poplars

SIKA DEER: DAVID CHAPMAN/ALAMY; BRAMBLINGS: DAVID KJAER/NATUREPL.COM; MISTLETOE: LIAM BUNCE/ALAMY

Seven-spot ladybirds can be found anywhere there are aphids to feed on

# Group huddles

MANY LADYBIRDS HIBERNATE IN groups, squashed together in the cracks between stones or inside crevices in bark. You may be surprised at how apparently unprotected these clusters are. But the ladybirds know they're safe – their bright coloration sends a warning to hungry birds that they taste unpleasant and are best left alone. The species most likely to be encountered in winter are seven-spot and harlequin ladybirds, the latter an arrival from Asia that has rapidly colonised western Europe since the early 2000s. Other less common hibernators may include orange, 14 and 22-spot, and cream-spot ladybirds.

The 14-spot ladybird stays in hibernation until as late as May

**ABOUT THE AUTHOR**

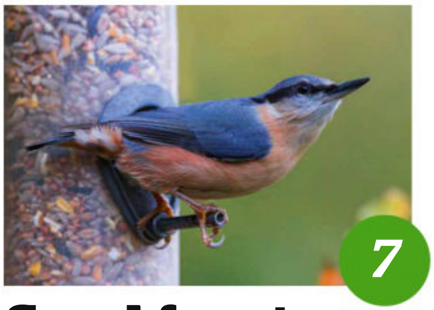
Ben Hoare is a wildlife writer, editor and all-round nature nerd. He also writes award-winning illustrated natural history books for children.

# Fur coat

Thick hair – actually modified scales – keeps the December moth warm on midwinter nights. There's nothing for it to eat at this time of year, but the insect did all its feeding as a caterpillar and, by emerging when bats are hibernating, it has fewer predators to contend with.

# Green glow

The emerald-green fronds of the hard fern shine like beacons in December woods drained of colour. In the absence of much other fresh foliage, deer sometimes browse the glossy rosettes, giving rise to this plant's common name in North America, deer fern.



# Seed feast

Nuthatches are sleek visitors to bird feeders, but usually stay mere seconds to grab a sunflower seed before leaving to stash their prize in the bark of a nearby tree. They'll eat it later and soon be back for more seeds, flying to and fro in order to build up their cache.

SEVEN-SPOT LADYBIRDS: FLPA/ALAMY; 14-SPOT LADYBIRDS: KIM TAYLOR/NATUREPL.COM; DECEMBER MOTH: CHRIS MATTISON/NATUREPL.COM; HARD FERN: WOLSTENHOLME IMAGES/ALAMY; NUTHATCH: MIKE O'CARROLL/ALAMY

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## NOTES ON NATURE

# KATE BRADBURY

“I feel I am part bird at this point at the year’s end: I’m ready for spring”

“THE WINTER SOLSTICE HAS A magic for me that other pagan festivals don’t quite hit. It’s the one I actively celebrate rather than simply nod to, as I do the equinoxes, the summer solstice and the spring markers of Imbolc and Beltane.

I wonder if it’s the darkness and the long slog of winter, the seemingly endless lack of life, and the cold (will it be cold?). Then the solstice comes and the days finally start lengthening again. Earth is turning on its axis and the sun will return. Phew.

This shift in the seasons is not immediately apparent, but it’s significant: it’s always only a few days before I notice the birds pick up their songs – robins sing throughout winter, but there’s an energy, a stubbornness, that comes after the solstice. Here, in Brighton, the great tits start singing around this time, too, and they are also pairing up and establishing breeding territories – even looking for nest-holes despite not needing them for several weeks.

The gradual lengthening of days is the little bit of hope we all need at this time of year, isn’t it? It’s a punctuation mark; a semi-colon in the longest sentence. I feel I am part bird at this point at the year’s end: I’m ready for spring and daring to dream it. Just a touch. Just enough to lift my head into the cold dawn sky, and sing a little.

In the northern hemisphere, the winter solstice usually falls on 21st or 22nd December, and varies due to our Gregorian calendar not being perfectly in sync with Earth’s rotation. While we celebrate the whole day, the actual solstice is a fraction of time, specifically the exact moment the sun sits over the Tropic of Capricorn. Here, it appears to stand still, which is where the word ‘solstice’ comes from – literally ‘sol’ (sun) and ‘sistere’ (to stand) – the day the sun stands still.

It has long been celebrated as the festival of Yule or Yuletide, and involves classic winter activities of eating, drinking and dancing. The light of the sun is conjured by a roaring fire, in which a yule log – usually the largest log saved for this day – is burned in ceremony. People gathered, as they do now, at stone monuments such as Stonehenge, where the sunset on the shortest day is captured between the stones. They also feasted on the meat of pigs and cattle that had been reared since spring, as suggested by the large amount of bones found in excavations in the Durrington Walls settlement in Wiltshire, where those who built Stonehenge lived. Other familiar traditions include taking holly and ivy into the home to make a wreath; the ‘Christmas’ tree, too, has its roots in Yuletide rituals.

How do you celebrate the winter solstice? I try to spend as much of the day outside as I can – there are just seven hours and 50 minutes of daylight to enjoy, so it feels appropriate to feel them as the birds do. This is easier on drier years. Sometimes I go for a walk and then spend time on my allotment. Other times I head to Brighton beach, where I watch the starlings murmurate over Brighton’s Palace and West piers as the sun sets. Some years I’m stuck indoors watching the rain fall.

Astrologically, the solstice marks only the beginning of winter, which means we have a long way to go before spring. But we are closer to it than we were when the days were still shortening, and that is worth all the celebrations we can muster. Happy solstice!

**Kate is a wildlife gardening expert and author. Her latest book is *One Garden Against the World* (Bloomsbury).**

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# WILD IN THE CITY

— WITH DAVID LINDO —

## A huge parliament of long-eared owls has made an unlikely home in a Serbian town square

AS A CHILD, I SAW owls as mystical beings that operated by night, were difficult to see at the best of times, and hung out in woodland locations far from the largely concrete surroundings of my home in London. And, of all Britain's owls, there was none more secretive than the long-eared owl, affectionately abbreviated to 'LEO' by birders.

This medium-sized owl is indeed quite scarce, normally detected by a haunting, wavering hoot that emanates from the deepest, darkest corners of woods. Its owlets, meanwhile, are renowned for their squeaky-gate squeals when begging for food from their parents. I usually observed the youngsters as singletons roosting, mostly obscured within a thicket, staring blankly back at me.

A long-eared owl asleep in Kikinda. The birds do not build their own nests, but re-use the abandoned nests of species such as crows

LONG-EARED OWL: ALIAKSEI KRUHLENIA/ALAMY

About 20 years ago, Serbian ornithologist Milan Ružić realised that large numbers of long-eared owls were roosting in urban areas of Serbia, north from Belgrade. With a small party of volunteers, he set upon a crusade to chart these gatherings. Over the ensuing years he calculated that upwards of 35,000 birds were regularly wintering in the region, putting the UK's paltry population of up to 4,000 pairs into the shade. There are good numbers of long-eared owls during the winter in the wider region, as visitors to Hungary or Bulgaria will testify, but the epicentre seems to be northern Serbia.

I asked Milan about the project and he explained that a big part of it involved convincing locals that the birds were not spectres of doom to be murdered on sight, but beneficial to have around. The phenomenal numbers, he said, are attracted by the urban tree cover, because the surrounding countryside is largely devoid of trees. The owls head into rural areas after nightfall to feed on the very rich supply of tasty rodents, themselves encouraged by traditional farming methods that leave abundant quantities of grain on the ground when crops are harvested.

It was the long-eared owl populations in the small towns and villages that most interested Milan. He found that spectacular numbers of these birds congregated in conifers and junipers in parks, back gardens and churchyards, and even in the trees lining the main streets. But no town surprised him more than Kikinda, which sits on the border with Romania, and whose main square hosts the biggest gathering of long-eared owls in the country.

From mid-December until the end of February, upwards of 850 individuals can assemble in the trees scattered across the square. The owls snooze during the day, but just before dusk, they become restless, sometimes sallying forth in a low, circular flight, almost as though they are stretching their wings, before embarking on the night's hunt in the outlying rural areas.

When I first arrived in Kikinda and wandered around, gawping at the owls, the locals looked at me as if I were a recently landed Martian. Nowadays, a much warmer welcome awaits visiting birders. Souvenir shops sell owl-themed paraphernalia, and November has even become Owl Month, during which children dress up accordingly.

Best of all, the national government of Serbia has designated Kikinda's town square as a nature reserve – a world-first – with officials imposing fines for anyone caught disturbing the birds. It's a truly fantastic conservation story that can only succeed if people continue to visit this very remarkable place.

**David Lindo, AKA the Urban Birder, is a naturalist, broadcaster and author of many books, including *Fly: A Child's Guide to Birds* (Magic Cat Publishing)**

## Mike Dilger's

### WILDLIFE SPECTACLES

The broadcaster, naturalist and tour guide shares the most breathtaking seasonal events in the world

# YEAR OF THE CAT

### PUMAS HUNTING IN PATAGONIA

Once a phantom of Chile's windswept peaks, this plucky feline is making a comeback

With a range spanning from Canada's boreal forests and Arctic tundra all the way to the steppes of southern Chile, the puma – also known as the cougar and mountain lion – has the widest distribution of any terrestrial mammal in the New World. It may vie with the leopard for the title of 'fourth largest cat', but in a hypothetical meeting of all big cats, the puma would probably only defer to the biggest three – the jaguar, lion and tiger.

Patrolling Torres del Paine

**Did you know?**

**Pumas start breeding at age two to three, and a female will give birth to two or three cubs. By 12 months, the youngsters will be accompanying their mother on hunting trips, and reach independence at two years.**

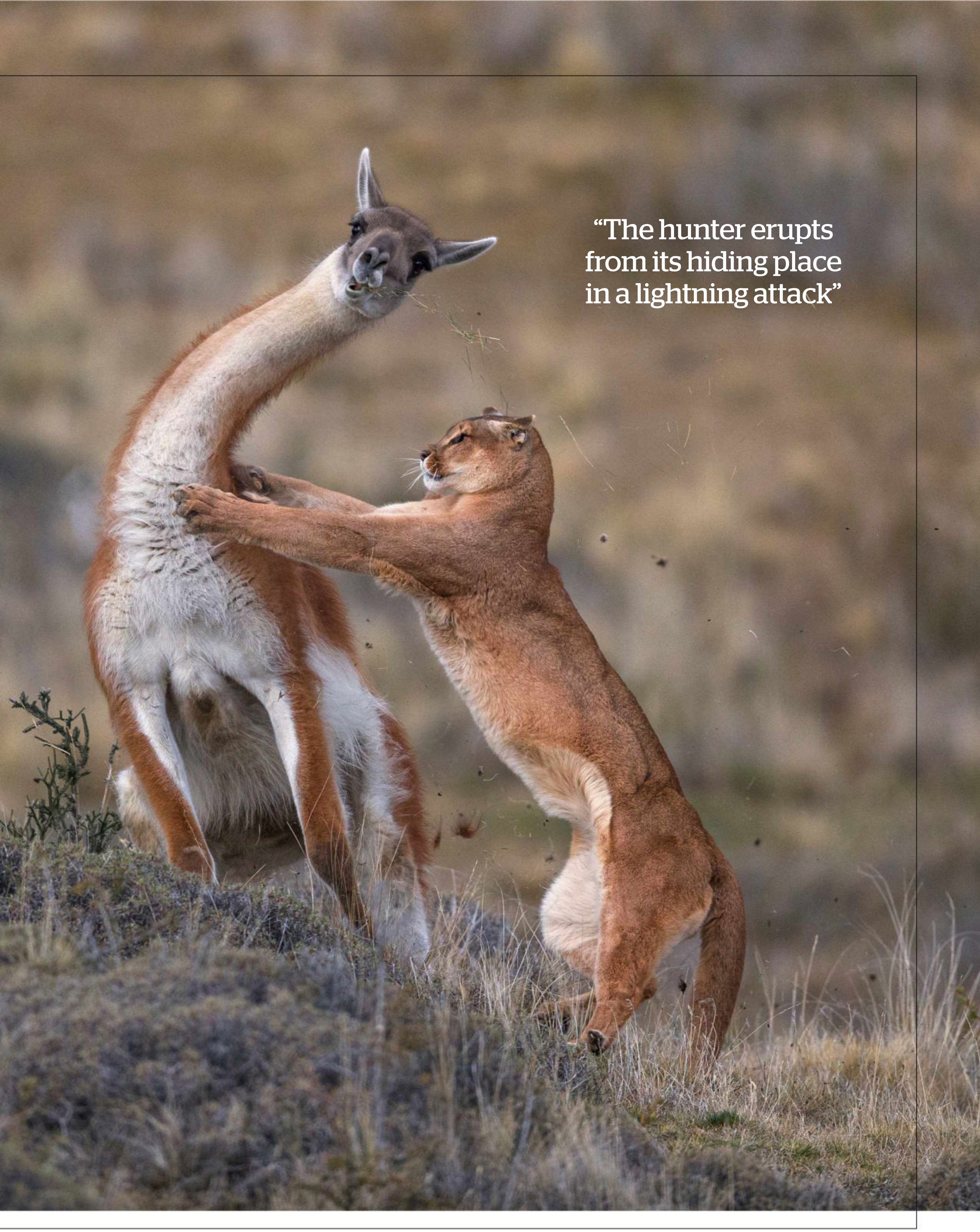
Until recently, a far more suitable name for this adaptable cat was 'ghost', because confirmed sightings were extremely rare. But in Patagonia – and more specifically in Chile's Torres del Paine National Park – efforts by the conservation community and the resulting boost from ecotourism have put an end to the cat's ghostly epithet in spectacular fashion.

With a hunting strategy that depends upon stealth, the dun-coloured puma is a master of camouflage in environments typical of Patagonia, which consist mostly of open and yet frequently broken terrain.

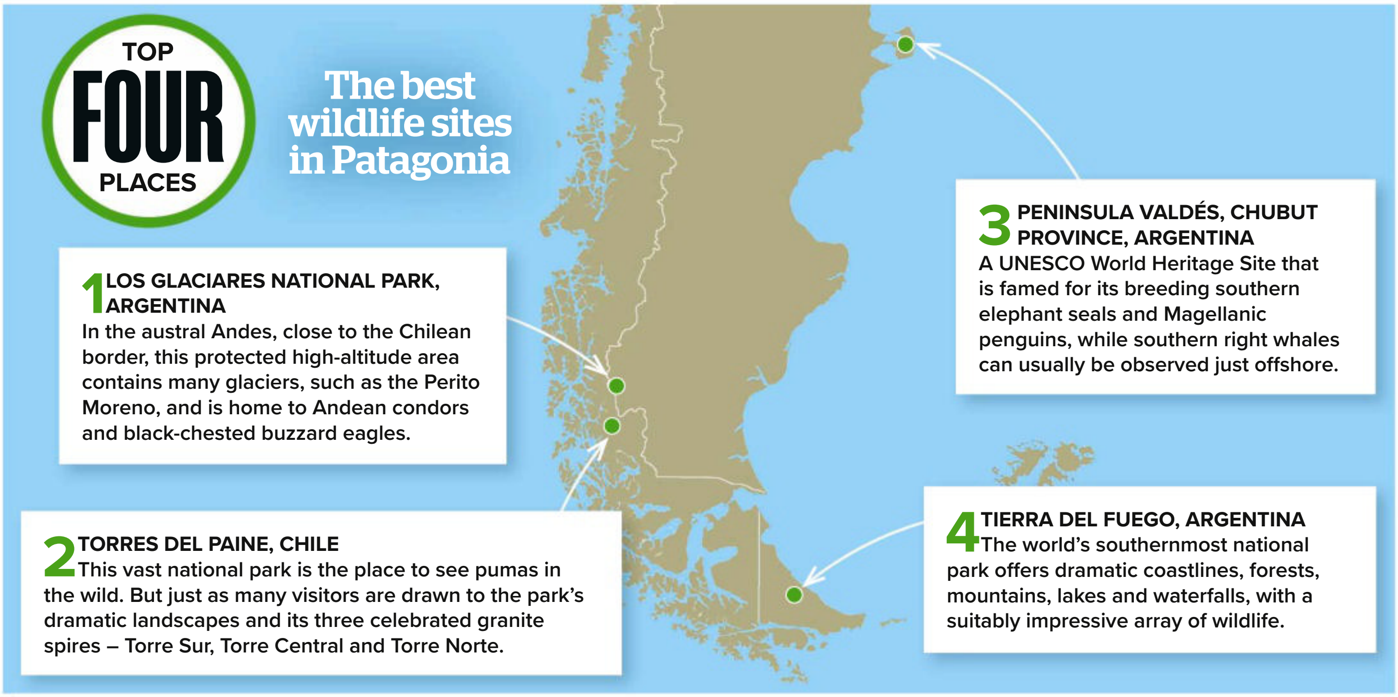
Pumas are largely solitary by nature and possess huge home ranges, so tend to be sparsely distributed, even in areas considered prime habitat. So, for potential puma spotters, the key to making your 'long

Pumas primarily hunt llama-like guanacos, but these camelids are not easy prey

HUNTING PUMA: INGO ARNDT/NATUREPL.COM; PATROLLING PUMA: NICK GARBUTT/NATUREPL.COM



> “The hunter erupts from its hiding place in a lightning attack”



TOP FOUR PLACES

## The best wildlife sites in Patagonia

**1 LOS GLACIARES NATIONAL PARK, ARGENTINA**
In the austral Andes, close to the Chilean border, this protected high-altitude area contains many glaciers, such as the Perito Moreno, and is home to Andean condors and black-chested buzzard eagles.

**2 TORRES DEL PAINE, CHILE**
This vast national park is the place to see pumas in the wild. But just as many visitors are drawn to the park's dramatic landscapes and its three celebrated granite spires – Torre Sur, Torre Central and Torre Norte.

**3 PENINSULA VALDÉS, CHUBUT PROVINCE, ARGENTINA**
A UNESCO World Heritage Site that is famed for its breeding southern elephant seals and Magellanic penguins, while southern right whales can usually be observed just offshore.

**4 TIERRA DEL FUEGO, ARGENTINA**
The world's southernmost national park offers dramatic coastlines, forests, mountains, lakes and waterfalls, with a suitably impressive array of wildlife.

shot' decidedly shorter is to understand the ecology of the puma, and to use the skills of trackers. These guides are not only familiar with the life histories of the best known individuals, but are well-versed in endlessly scanning for animals hidden in the landscape or at least detecting signs of their presence.

Pumas are mainly active at dawn and dusk, so early starts and late finishes will increase your chances of an encounter, while insider knowledge of sighting hotspots will narrow down your search field. In Torres del Paine, for example, most tracking is carried out along the park's eastern border, within a triangle created by Laguna Armaga and the Sarmiento and Nordenskjöld Lakes.

Watching guanacos – the puma's preferred prey – and learning to read their behaviour is key to a sighting. These wild relatives of the llama are far better at detecting hidden pumas than we are, because their survival depends on it. Guanaco herds frequently place a 'sentinel' on a vantage point to look out for danger while the remainder of the herd are quietly grazing. When a puma is spotted, the sentinel emits a loud alarm call that sounds like a high-pitched bleat. This signals that the puma's cover has been blown and hugely hinders its chance of snaring a meal. It also helps any human onlookers to pinpoint the cat's position.

> "Pumas are capable of catching twice the amount of food they need"

Roughly one in five hunts are successful – not only are guanacos larger and faster than pumas, but they are able to defend themselves with a vicious kick. But when it does happen, a kill is an unforgettable event to witness. Like all stalk-and-ambush predators, the puma is adept at using the terrain to its advantage. Having painstakingly advanced to within 15–20m of its quarry, the hunter erupts from its hiding place in a lightning attack. It sprints to catch up with and overpower its prey, finally incapacitating it with a bite to the head or neck.

As guanacos can top the scales at more than 100kg, a kill won't be consumed in one sitting, and any leftovers are carefully cached. Research has shown that pumas, along with other solitary cats, have the highest kill-rates among all carnivores, capable of catching twice the amount of food they need. This 'surplus' effectively operates as an insurance policy against any kills stolen by rival predators. There is no doubt that the scavengers that share the puma's territory, such as the culpeo fox and Andean condor, hugely benefit from its ruthless efficiency – a captivating cat that can punch well above its weight. Ⓦ

Pumas are mostly solitary ambush hunters and stalk their prey for an hour or more

**LOOK CLOSER**

## Ecosystem engineers

Pumas in Torres del Paine keep guanaco herds on the move, which prevents overgrazing of the grasslands and allows the terrain to recover. The soil surrounding a kill can become inadvertently fertilised, providing rich forage for future generations of these camelids.

Guanacos

## Star turns

Following the 1980 ban on hunting pumas in Chile, sightings in Torres del Paine began to rise. In 2005, two young females, Mocha and Sarmiento, were regularly reported, appearing less afraid of humans. This tolerance seems to have been passed onto their offspring – and with it a boom in the region's ecotourism.

## Trustworthy tracking

Tracking is restricted to the park's main trails, but tracking on foot is permitted on private land. Responsible guides would never search in or around dens, and by reading a puma's behaviour, should ensure viewing is conducted respectfully and from a safe distance.

## NEXT MONTH

Adélie penguins, the most numerous bird in Antarctica

SILHOUETTED PUMA: JOSE B. RUIZ/NATUREPL.COM; GUANACOS: INGO ARNDT/NATUREPL.COM; ADÉLIE PENGUINS: BEN FOX/ALAMY

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## Nick Baker's

### HIDDEN WORLD

The popular naturalist, author and TV presenter reveals a secret realm of overlooked wildlife

# ISLAND LIFE

### GIRAFFE-NECKED WEEVIL

## This curious species of long-necked beetle is unique to Madagascar

Of the 60,000 or so species of named weevils on this planet, *Trachelophorus giraffa* stands out by, well, a neck's length. It is one of the iconic and endemic 'must-see' species for those planning a visit to the island of Madagascar.

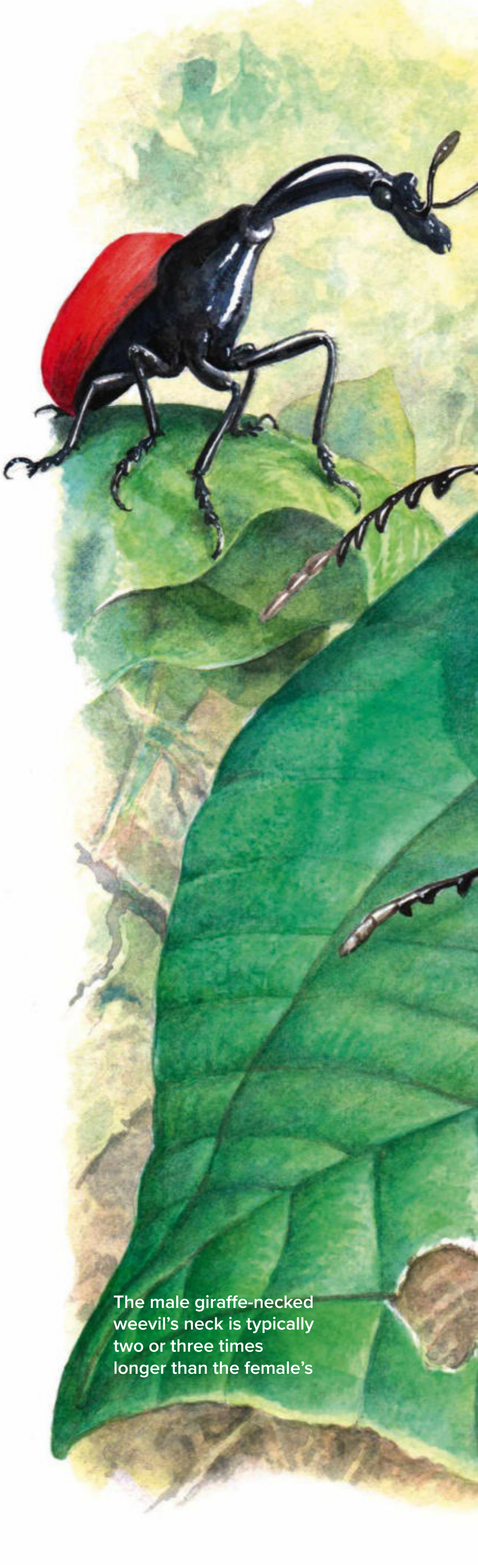
The giraffe-necked weevil is relatively small at 25mm at full stretch, but its bright, berry-red wing cases, which contrast with the black, lustrous body, make it 'pop' against the lush foliage of its eastern Madagascan forest home. It is the weevil's extraordinary anatomy, though, that makes it a must-see for visitors.

These weevils, like so many creatures on this group of islands off the southeastern coast of Africa, are found nowhere else on the planet. As is often the case in the natural world, when something appears bizarre, it frequently has a compelling story behind it. It is undoubtedly the 'neck' that generates the most questions. The male has the most spectacular and lengthy neck, comprising two extremely elongated segments immediately behind the head, giving it the profile of a small JCB.

But to the biologist, the question is, what is its purpose? Why the long neck? It took me quite a bit of time and patience to witness the neck in action. Weevil watching is made more challenging by the extreme sensitivity of these insects to disturbance. Just a careless brush against the foliage or a knock on a branch – sometimes you need only look at a weevil in a funny way – and they either pull in their legs and drop off, to be lost in the weeds, or they achieve what looks like a mechanical impossibility and fly off.

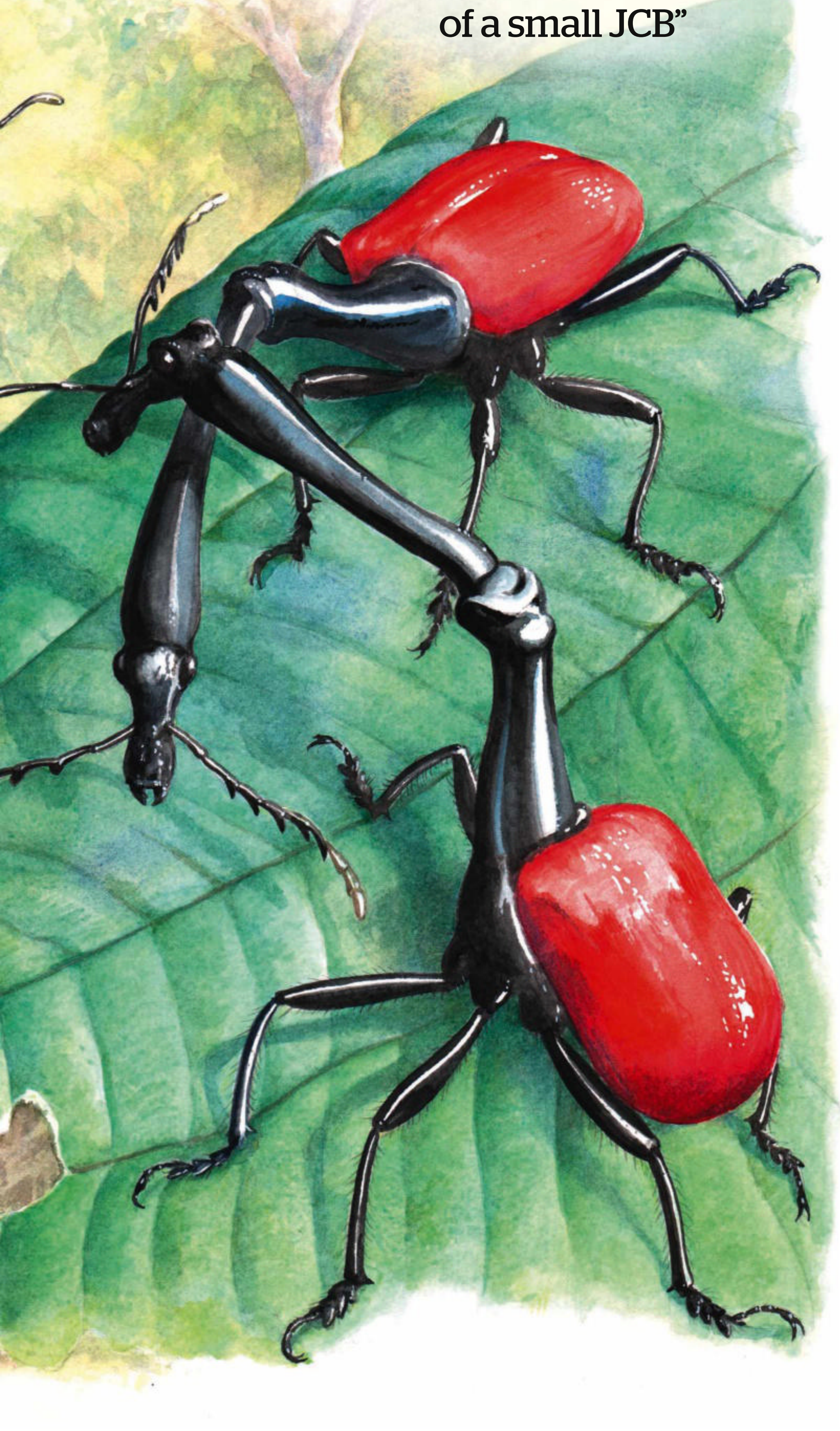
Eventually, though, several weevils later, two males were found together, using a leaf of what is often referred to as the 'giraffe-necked weevil tree', *Dichaetanthera cordifolia*, as a wrestling ring. Each male uses its neck to push, lean, flip and shove its opponent, a scene not dissimilar to a couple of stags battling it out during the rut. And, just like the deer, they have an audience.

The shorter-necked females look on, and it seems that the neck is a means by which the males compete for their attention and, therefore, mating rights. But what about the females? They might have a neck that is two or three times shorter than that of the males, but they still have a longer-than-average front-end extension compared with most other weevils. They also have



The male giraffe-necked weevil's neck is typically two or three times longer than the female's

“The spectacular neck gives it the profile of a small JCB”



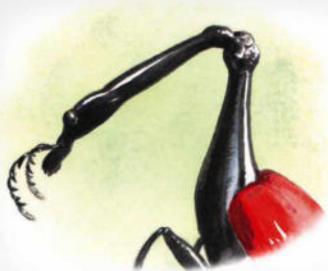
another feature that is rarely mentioned: really chunky thighs.

The females may not be as iconic as the males, but they are arguably even more fascinating. Once they’ve mated with their chosen partner, they set about the highly labour-intensive process of laying an egg – one of the reasons they’re found on a specific species of tree. Here, the female creates a parcel from one of the leaves.

She accomplishes this through a complex procedure of biting along the veins, creating scored lines that makes it easier to fold. She then straddles the centre vein of the leaf lengthwise and, using her powerful legs, squeezes the two sides of the leaf together. She folds the leaf in from its ends, pushing, pulling and tucking the folds into place. This is where her neck comes in handy: it acts as a stout lever and bradawl in one, and she employs it to slowly construct a cell for her egg, with the previously bitten holes interlocking like Velcro. It is a sewing project of great complexity and beauty.

She does all the work at this stage, with the males strutting around, guarding her from other males and perhaps predators and parasites. When she’s finished, she lays a single egg inside the leaf package before a final snip sends the whole thing falling to the forest floor. Once the solitary weevil grub, safely contained inside a sort of live-in burrito, has hatched from the egg, it spends the first days of its life feeding on the walls of its nursery. A wonder weevil indeed.

**LOOK CLOSER**



The long neck is also used to attract females

## Stick your neck out

**As well as being a handy armament in mating tournaments, it seems the male’s neck is also used in display, where it will show off with elaborate dances and poses in the presence of females. It’s a textbook example of what biologists call sexual selection, with the ‘neckier’ males seen as being the most desirable by the females. Not unlike tusks on elephants or antlers on deer, just a little smaller.**

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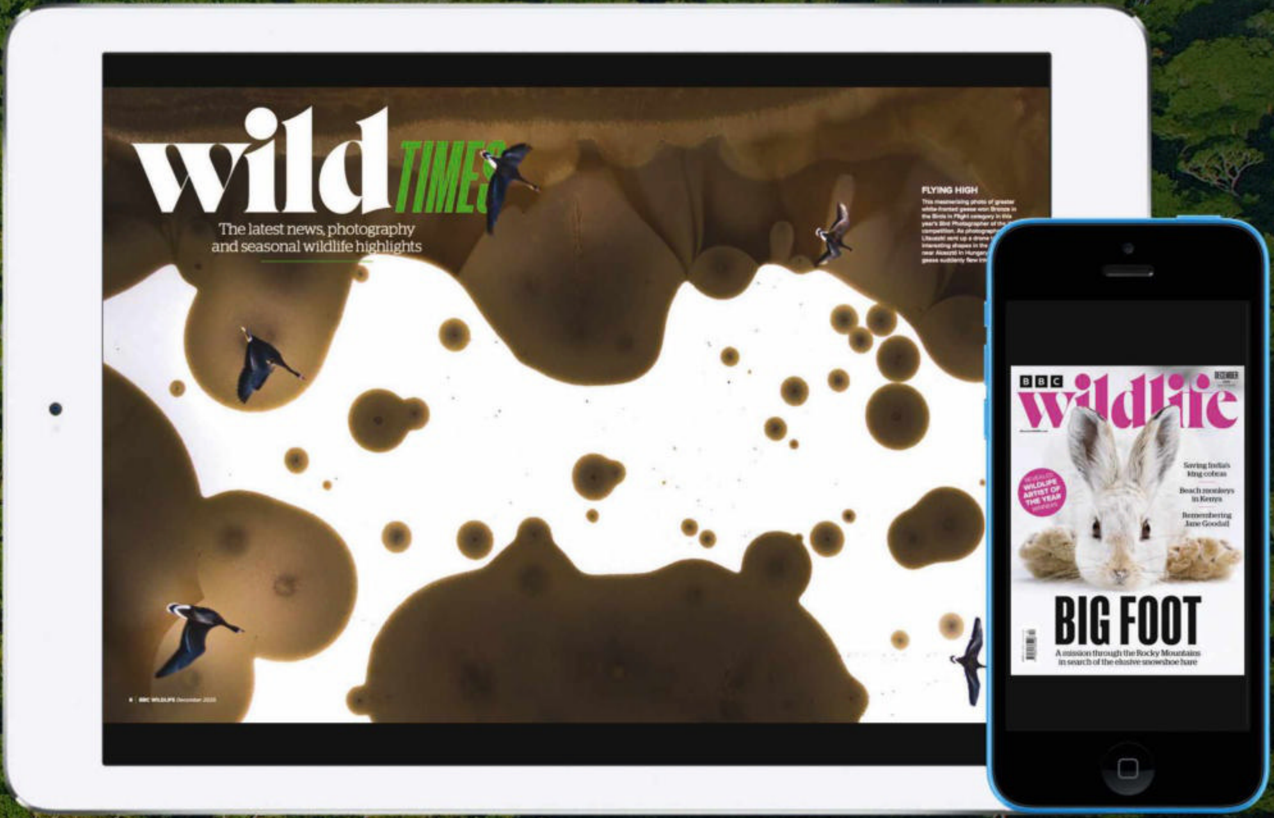
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Jane Goodall in Gombe National Park, Tanzania

JANE IN GOMBE IN 2014: DANITA DELIMONT/ALAMY

# Remembering Jane

The ethologist, conservationist and humanitarian Dr Jane Goodall died in October. We reflect on the woman who gave the world hope

*By* **BEN GARROD**

BBC SOUNDS

***Discovery***
***The Life Scientific: Jane Goodall***
In this interview from 2020, available again on BBC Sounds, Jane Goodall reflects on her life and work, including her time living with wild chimpanzees.

Jane in 1965 with chimp David Greybeard, the first to trust her

In the TV show *Miss Goodall and the Wild Chimpanzees*

JANE WITH DAVID GREYBEARD: EVERETT/SHUTTERSTOCK; TV SHOW: CBS PHOTO ARCHIVE/GETTY

LIKE COUNTLESS others, as a child I dreamed of one day working with animals. I learned how to identify bird calls, collected anything I could find on the high-tide line, and once even picked up a dead shark on a school cross-country run.

But really, I wanted to move to a tropical rainforest thousands of miles away to study wild chimpanzees, just like Jane Goodall, my childhood hero. It was very much one of those big, seemingly impossible dreams that many children have, but I did everything necessary to reach my ambitious goal – I worked hard at school and college, and got into a great university on a fantastic degree course. I had everything planned, or so I thought. As it turned out, I just needed to be good at serving soup.

In the final months of my animal behaviour degree at Anglia Ruskin University in Cambridge in 2005, working as a silver service waiter, I found myself serving Dr Jane Goodall herself. As I ladled steaming soup into her bowl, I summoned the courage to strike up a conversation. By the time I served her coffee, it appeared I had cemented a rather unconventional and wholly unexpected route to that African forest of my dreams.

Just a few months later, I was sitting under the towering forest canopy in western Uganda, listening to the pant-hoot cacophany of the chimpanzee community I was now living alongside.

Inspired by tales of Jane's work in Tanzania decades before, I thought of her often. I thought of her whenever the chimps seemingly refused to habituate themselves to my presence, despite my carefully planned, but naively short, timeline. I thought of her whenever I had to search for, and inevitably remove, parasites clinging on to me as I clambered into bed each night. And I thought of her whenever I missed my family and home.

Jane became a fixture in my life. We exchanged emails whenever I visited the nearest town and could use the internet cafe, and we spent time together whenever she visited Uganda. We talked candidly about work and I was able to get to know the person behind the legend. The 'legend' of Jane Goodall was, and still is, strong. It's easy to think she was the first person to work with wild apes successfully; the first to see chimpanzees hunting; the first to witness tool use in non-human primates. It's a long list.

But she didn't actually achieve any of these things, and it's important to put Jane's work into context. Her studies built on the success of previous field researchers (and not just men) who had worked with wild apes before. In 1959, a year or so before Jane arrived in Gombe (in what, in 1964, would become Tanzania), American biologist George Schaller began his 20-month observation of mountain gorillas in Rwanda. Schaller himself was following in the pioneering footsteps of British researchers Jill Donisthorpe and Rosalie Osborn, who had laid down the foundations for working with wild apes in Africa in the mid-to-late 1950s.

Jane never worked alone in Tanzania. She moved to the remote field site with her incredibly supportive mother, Vanne. When they arrived on 14th July 1960, they were supported and assisted by a local team consisting of a porter named Rashidi, a game scout called Adolf, and the camp cook, Dominic. The team quickly grew to include others such as game scouts David, Marcel

## ABOUT THE AUTHOR

**Ben is professor of evolutionary biology and science engagement at the University of East Anglia, and is also a broadcaster and author.**

Jane observes chimp behaviour in Tanzania, 1987

“Her life demonstrates, more than anything, the importance of teamwork and collaboration”

and Saulo. None of Jane’s work would have been possible without the help and support of local Tanzanian people. Her early studies were forged in the cooperative effort of family, the local community and fellow researchers, and her life demonstrates, more than anything, the importance of teamwork and collaboration.

While there were earlier anecdotal reports of tool use and hunting in chimpanzees – some of which dated back more than 100 years – Jane was the first to scientifically record these behaviours, and this work was invaluable. The earlier observations are of course important, yet the quantifiable scientific approach Jane adopted in Gombe allowed the scientific community to further study our closest living relatives in a much more reliable fashion.

Just like the social apes she loved so much, it’s fair to say that Jane’s groundbreaking scientific discoveries were a great example of cooperation. And by championing cooperation, Jane tirelessly and selflessly empowered young people. Years after I’d left the forest, I acted as a trustee for the Jane Goodall Institute and witnessed first-hand her vision for young people across the globe. Her Roots & Shoots programme viewed the younger generations as seedlings who, with the right support and nourishment, would flourish and grow to become active and engaged members of our worldwide society. These grassroots projects have, since the early 1990s, run in more than 60 countries and have covered themes ranging from restoring deforested regions in the Democratic Republic of the Congo to removing microplastics in aquatic environments. I once attended a fashion show inspired by recycled materials and household waste. The youngsters involved were driven and passionate, not because they were there with Jane, but because she had brought together like-minded people who were ready for change.

That was Jane’s influence: she galvanised others. She made us all believe we had the power to make a difference. She didn’t change hearts and minds because she didn’t

Speaking at Glastonbury Festival in 2024

JANE IN 1987: PENELOPE BREESE/GETTY; AT GLASTONBURY: PA IMAGES/ALAMY

With fans after a talk at the National Museum, Nairobi, in 2013

> “She was a true nomad, dedicating her life to inspiring the people she met”

need to. She led them. She empowered generations. She equipped millions of people to recognise the voice they already had and the power they already wielded.

Jane was creating global networks and communities long before social media connected us, and she was out there talking with presidents and business leaders, academics and policymakers, children and teachers long before the phenomenon of influencers had taken hold. To use a term more common in academic circles, Jane made us all ‘stakeholders’. We suddenly had skin in the game – so when she passionately talked about intensive farming, or habitat destruction, or unethical research practices, or biodiversity loss, she made us understand that not only did each of these issues affect us, but that it was not outside our power to address them.

Jane often said she travelled more than 300 days a year, and hadn’t spent more than a few weeks continuously in one place for decades. She was a true nomad, dedicating her life to inspiring the countless people she met. She never lost sight of the fact that change was always possible and that, if we are to stand a chance of achieving that change, we need to maintain a sense of hope and optimism above all else.

I often wondered about the toll Jane’s endlessly busy life must have taken. She was small in stature and worked hard right up until her death. Her way of life would have been too much for the vast majority of us, but she was held on such a pedestal. More than once, I feared there was too much resting on just one pair of shoulders. She was held up as an inspiration for young women (and men) in science; she gave countless positive and optimistic talks on subjects where it would be all too easy to feel apathy and fear; and was the figurehead for a global charity and worldwide movement for social (and environmental) change. I don’t know anyone else who could, or would, have taken on such a responsibility.

WE USE THE TERM ‘national treasure’ widely, but Jane Goodall is in that category. If there was an equivalent ‘international treasure’, she would be on that list, too. From being a young woman fresh out of secretarial college, she moved to Africa to live with wild apes, completed her doctorate, and then founded an international conservation charity that would empower countless young people around the world. Jane did about as much as any one person can do to change the planet for the better. Perhaps Jane’s legacy can be for more of us to emulate her life when and where we can, leaving one of her favourite quotes – “Together we can, together we will” – to ring out and resonate, just like those loud chimpanzee pant-hoots she loved so much.

**LOOKING BACK**

## In the words of Jane Goodall

“

You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make.

---

Farm animals are far more aware and intelligent than we ever imagined and, despite having been bred as domestic slaves, they are individual beings in their own right. As such, they deserve our respect. And our help. Who will plead for them if we are silent?

---

For those who have experienced the joy of being alone with nature there is really little need for me to say much more; for those who have not, no words of mine can even describe the powerful, almost mystical knowledge of beauty and eternity that comes, suddenly, and all unexpected.

---

I learned from my dog long before I went to Gombe that we weren’t the only beings with personalities. What the chimps did was help me to persuade others.

---

Hope is contagious. Your actions will inspire others.

---

Today’s young people – everywhere I go – they’re so excited and empowered. We’re listening to their voices. That gives us a reason to hope.

AT THE NATIONAL MUSEUM, NAIROBI: TONY KARUMBA/GETTY; PORTRAIT: ERIK TANNER/GETTY

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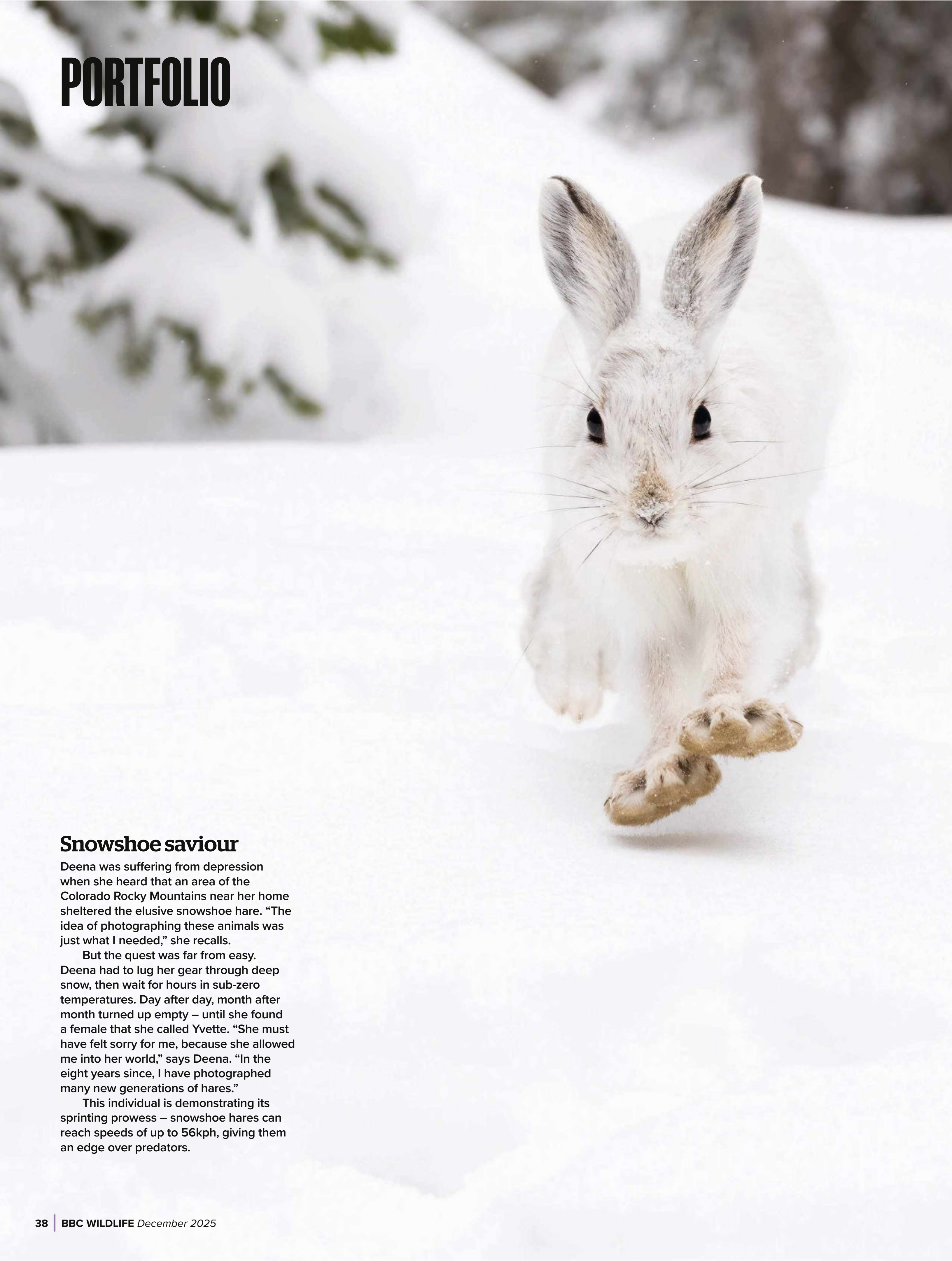


## Snowshoe saviour

Deena was suffering from depression when she heard that an area of the Colorado Rocky Mountains near her home sheltered the elusive snowshoe hare. “The idea of photographing these animals was just what I needed,” she recalls.

But the quest was far from easy. Deena had to lug her gear through deep snow, then wait for hours in sub-zero temperatures. Day after day, month after month turned up empty – until she found a female that she called Yvette. “She must have felt sorry for me, because she allowed me into her world,” says Deena. “In the eight years since, I have photographed many new generations of hares.”

This individual is demonstrating its sprinting prowess – snowshoe hares can reach speeds of up to 56kph, giving them an edge over predators.

# SNOW DAYS

**High in the boreal forests of Colorado, the snowshoe hare lives a secretive life. But one photographer has gained a unique window into its world**

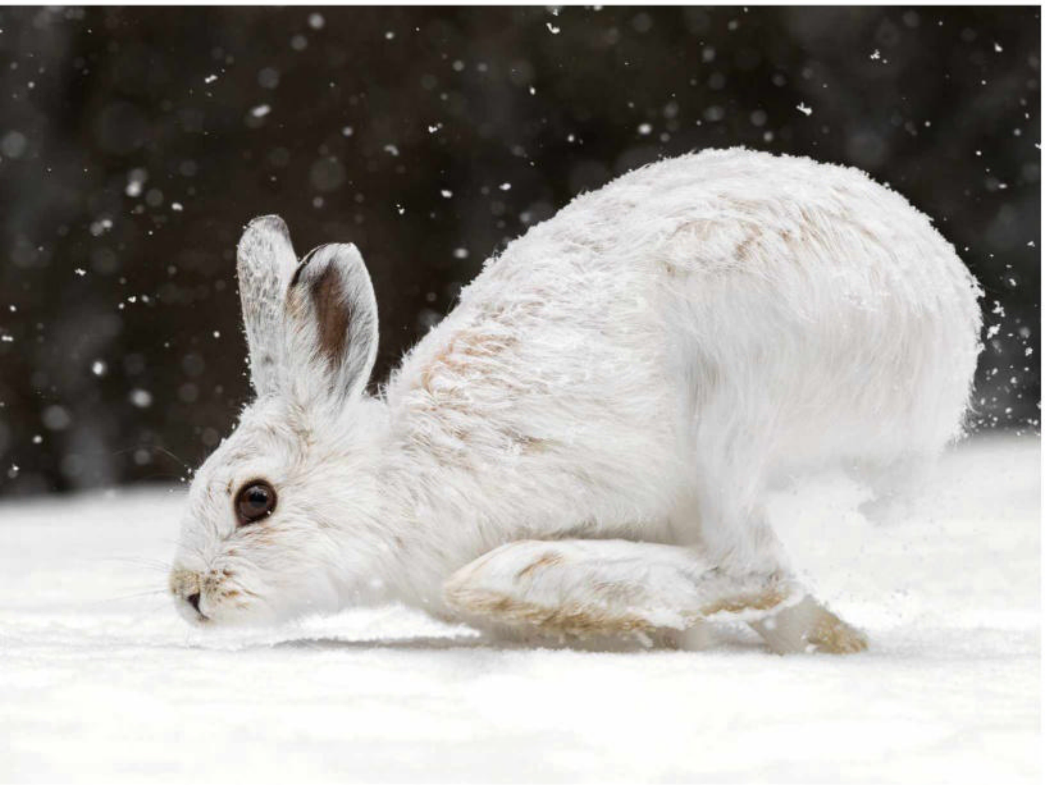
*Photos by* **DEENA SVEINSSON**

## High alert

Snowshoe hares have excellent hearing and can detect the slightest sound – of a predator, human or other hare. Standing on their powerful hind legs, they move their ears in the direction of the sound to zone in on it.

## Into the woods

Flashing the soles of its feet, a hare dashes into the trees. The species is found in high boreal and alpine forests across the northern US and Canada, at altitudes of up to 4,000m. With predators such as lynx and coyotes, it is skittish in nature. "If a hare senses danger, it will flee in a puff of powder," says Deena.



## Let it snow

The snowshoe is the smallest of North America's hare species and perfectly adapted to its chilly environment. Its compact ears – shorter than those of its cousins – reduce heat loss, while its dense, insulating coat turns white in winter for camouflage. To further conserve warmth, snowshoe hares sometimes curl into balls, puffing up their fur.

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### ABOUT THE PHOTOGRAPHER

A former commercial airline pilot, Deena is an award-winning wildlife and conservation photographer based in Estes Park, Colorado, USA. She spends most of her time photographing the wildlife of the Rocky Mountains.

## Stretching out

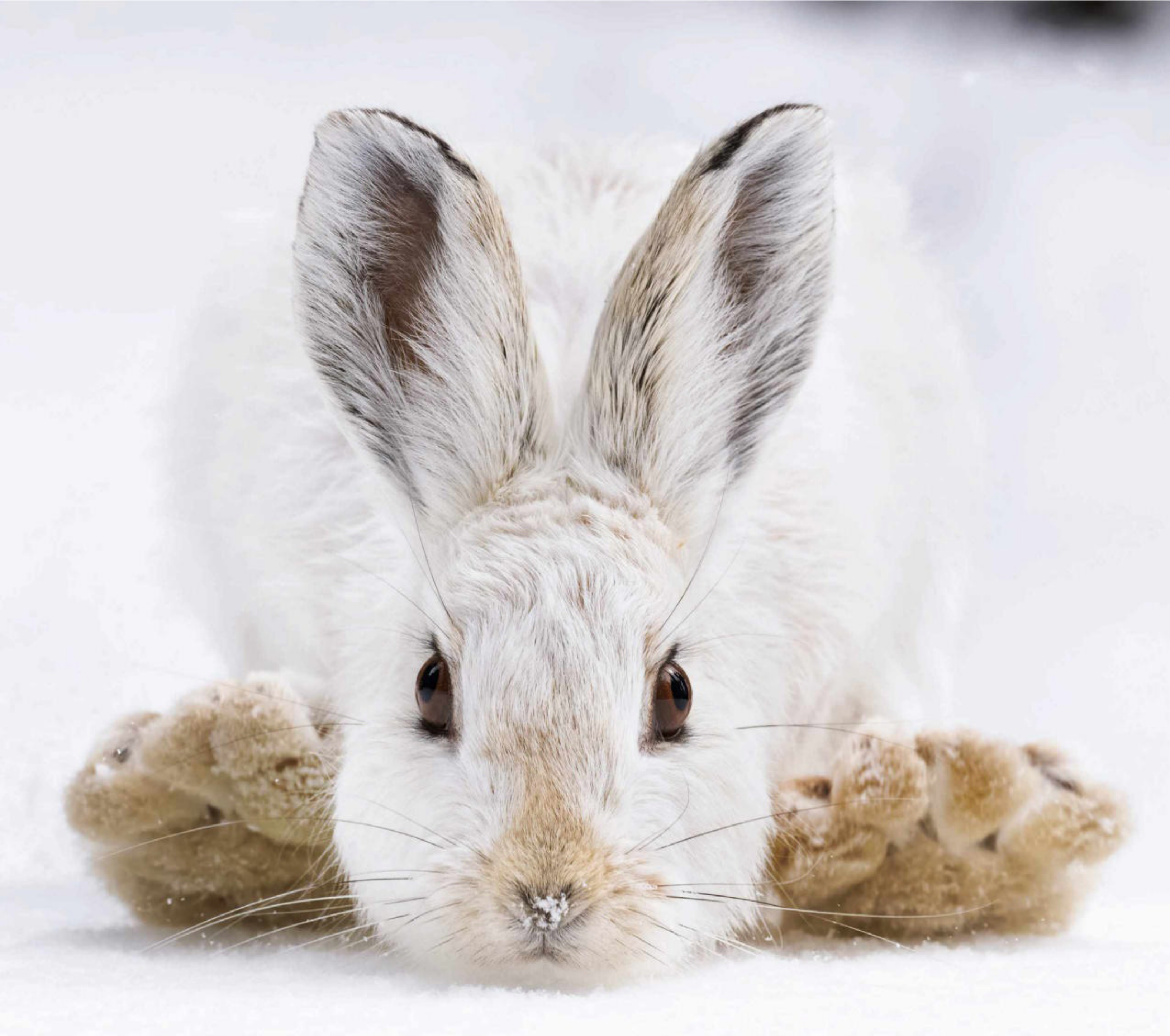
In the thick of winter, snowshoe hares spend much of the day napping. On waking, they often partake in some light stretching to loosen up before foraging for food.

## Winter larder

Food is scarce in winter, and the hares often have to make do with bland pine needles and branches foraged from the ground. As the snow piles up, it becomes easier to reach the tastier foliage still on the trees. The hares nibble aspen bark and willow twigs when available and, to quench their thirst, they eat snow.

## On the move

After a fresh dump of snow, the hares still move with ease, their limber bodies and large feet allowing them to bound across even the deepest drifts. "When I see their pristine white coats against a backdrop of freshly fallen snow, I'm on cloud nine," says Deena.

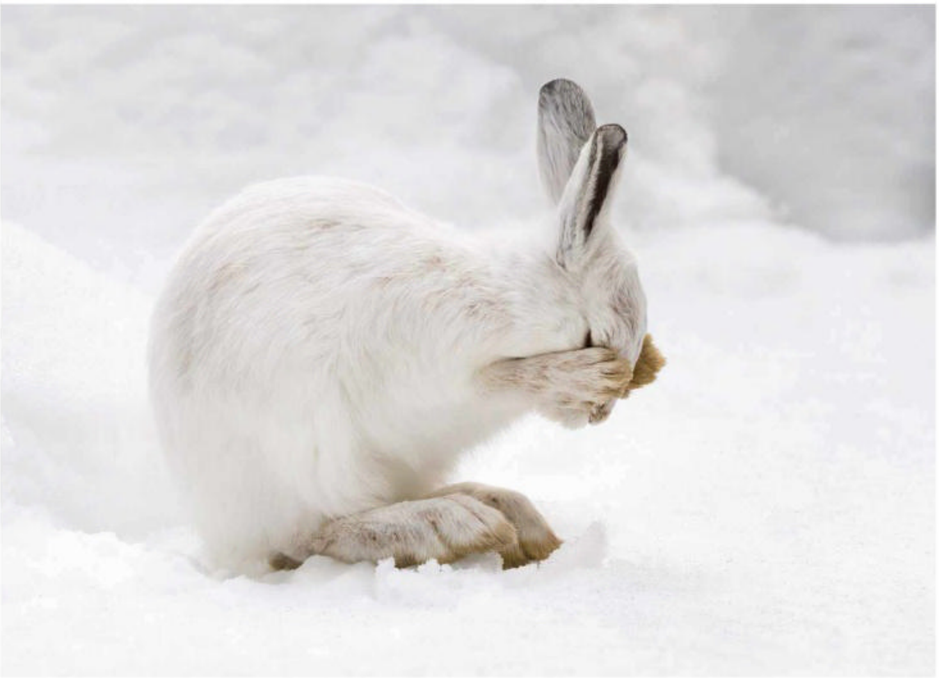


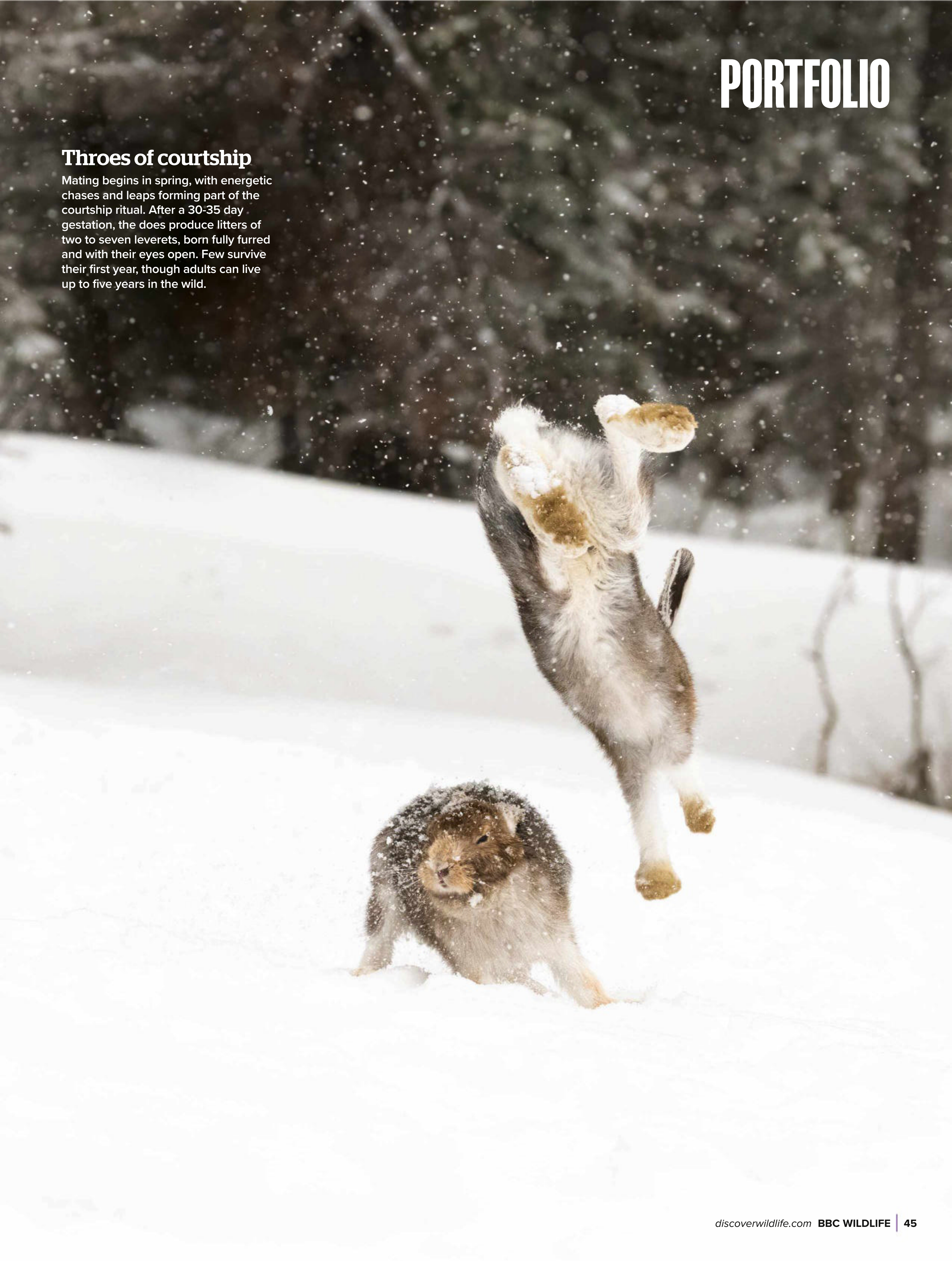
## Feet first

It's obvious how the snowshoe hare got its name. Those oversized hind feet, covered in long, coarse hairs, act like natural snowshoes. Reaching up to 16cm long, they spread the hare's weight, keeping it from sinking into the soft snow – a vital survival strategy. "We rarely see the feet from this perspective," says Deena. "This image tested my patience and skill – it took six years to get."

## Keeping clean

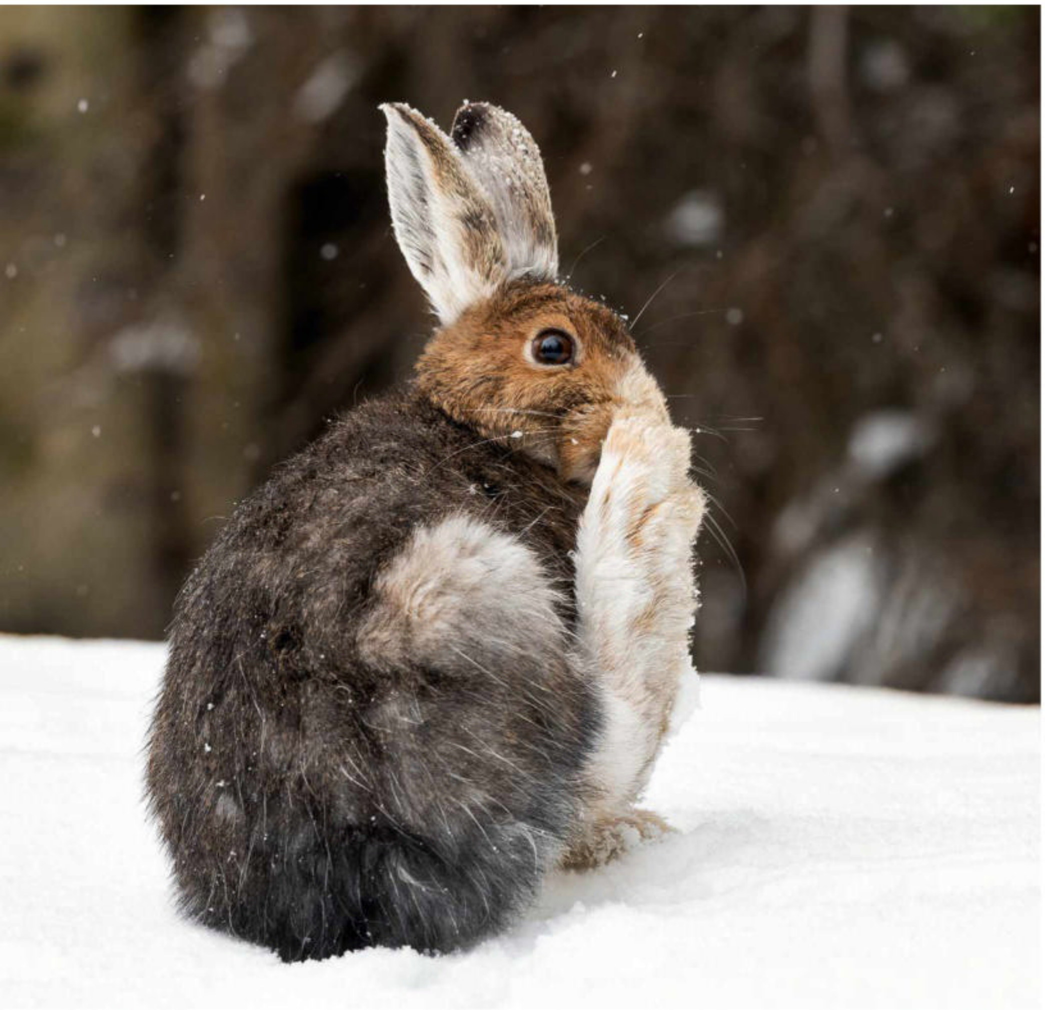
Grooming helps to keep fur in good condition, optimising camouflage and insulation, and can prevent parasite infestation. When a hare grooms, it often wets its paws and scratches and cleans its nose and ears.





## Throes of courtship

Mating begins in spring, with energetic chases and leaps forming part of the courtship ritual. After a 30-35 day gestation, the does produce litters of two to seven leverets, born fully furred and with their eyes open. Few survive their first year, though adults can live up to five years in the wild.



## Leaf lunch

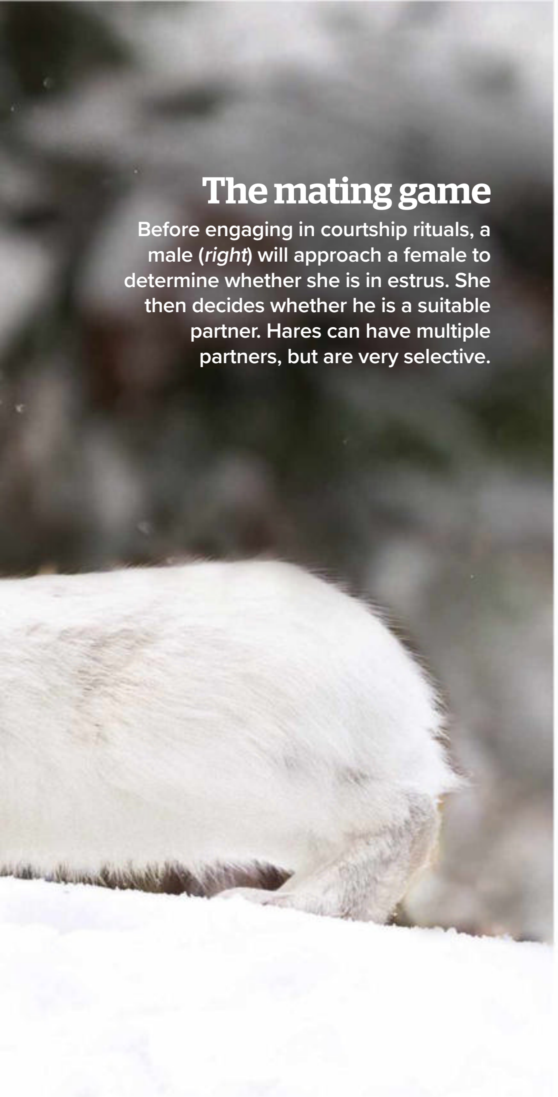
As summer rolls into the Colorado Rockies, snowshoe hares transition to brown coats. Food is now plentiful, with new roots and shoots, budding grasses, flowers, mushrooms and green leaves, and the hares constantly eat in the shade of the trees. “Even when they detect my presence, they continue to munch, unfazed,” says Deena.

## Foot care

Snowshoe hares often groom their feet, particularly between the toes. The fur on their feet remains white, even during the warmest summer months.

## Hiding in plain sight

Rather than burrowing underground, the hares seek refuge in forms – natural depressions in the snow – sometimes under the thick brush of branches or bushes. Forms provide excellent hiding places, both from predators and humans. “Snowshoe hares are intriguing creatures that hop into your heart,” says Deena. “They hopped into mine and have never left.”



## The mating game

Before engaging in courtship rituals, a male (*right*) will approach a female to determine whether she is in estrus. She then decides whether he is a suitable partner. Hares can have multiple partners, but are very selective.

# LIFE'S A BEACH

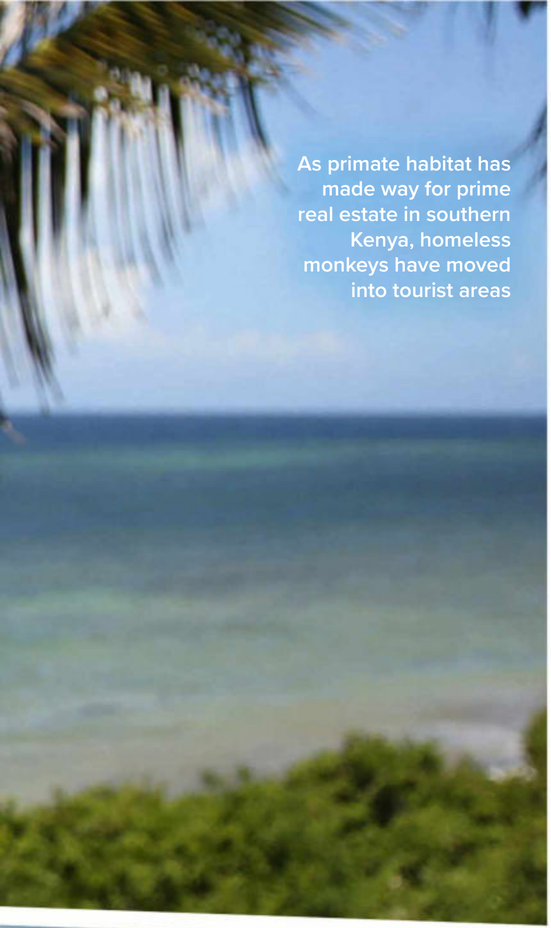
The Angolan colobus monkey dwells in the southernmost corner of Kenya

Monkeys are overrunning Kenya's tourist hotspots in the south of the country. Their apparent abundance in Diani, however, is not a straightforward conservation success story

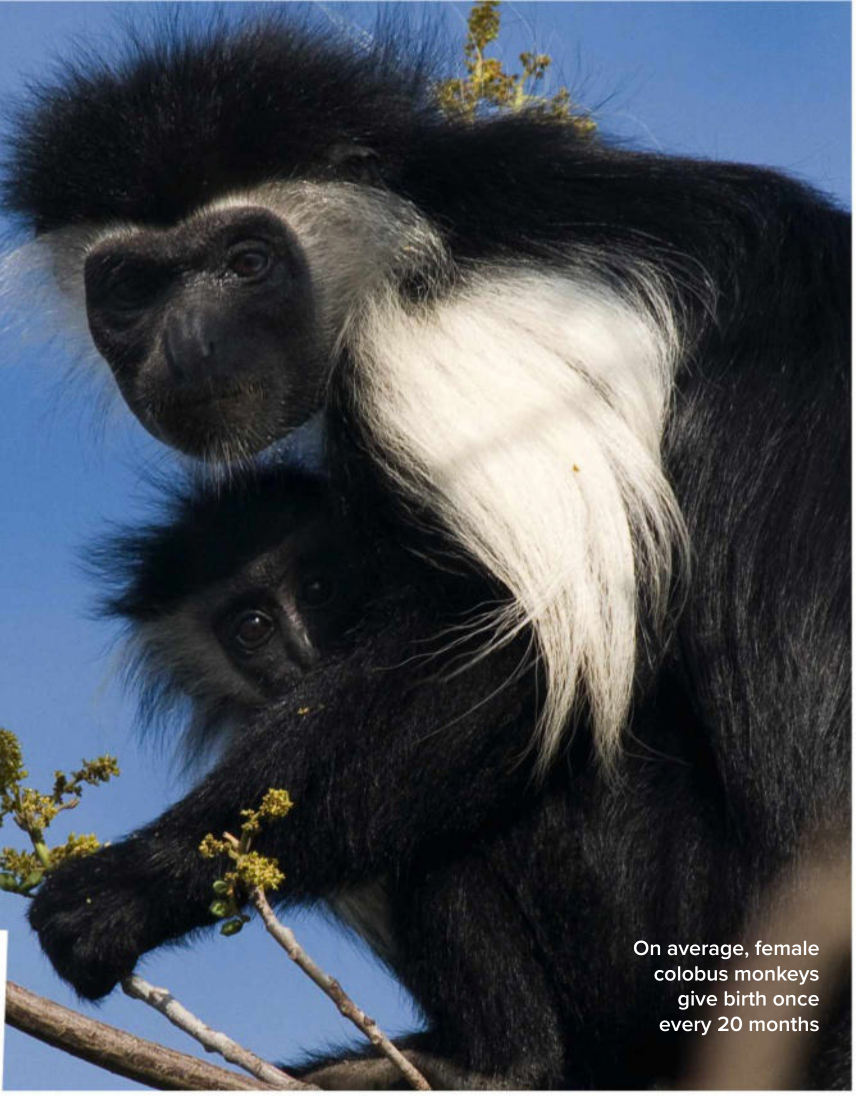
*Words by* **BETH RICHARDSON**

PETER'S ANGOLA COLOBUS MONKEY: ROLAND SEITRE/NATUREPL.COM

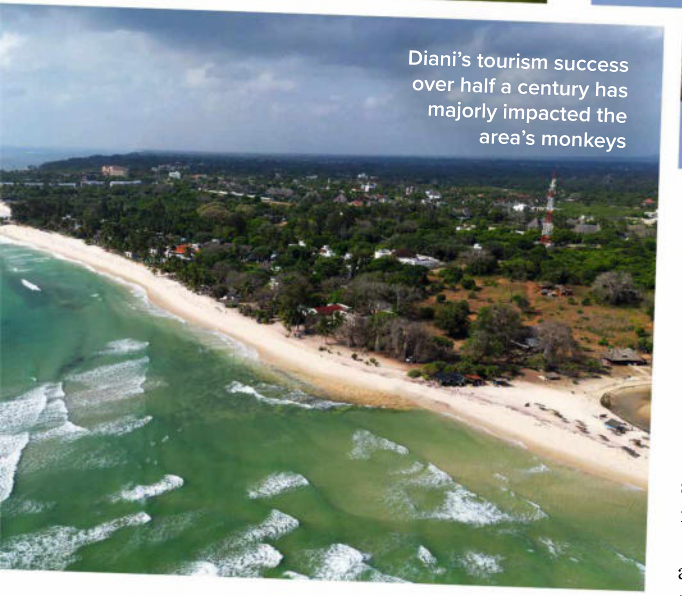
AMBLING ALONG DIANI BEACH ROAD, 30KM south of Mombasa in Kenya, I am parallel with the Indian Ocean and minutes from the powdery, cream sand of Africa's best-known beach. It's February, the heart of the dry season and peak tourist time. The sun is high, it's hairdryer hot and the air is sweet with ripe fruit on roadside stalls.



As primate habitat has made way for prime real estate in southern Kenya, homeless monkeys have moved into tourist areas



On average, female colobus monkeys give birth once every 20 months



Diani's tourism success over half a century has majorly impacted the area's monkeys

> "Three Angolan black and white colobus monkeys bounce along the wall to a flowering tree"

Drapes of rainbow kikoys flap like bunting on the breeze, shading the street sellers and enticing a steady stream of tourists to view their wares, while puttering tuk-tuks weave between speed humps, offering lifts with a loud *meeh, meeh*.

I round a corner towards my beachside B&B and bump into a huge yellow baboon. He darts me a sideways glance as he picks through leaves and rubbish. I hesitate slightly. Avoiding eye contact, I continue past him with feigned indifference. He joins me, and we walk side by side for a few seconds.

The yellow baboon is the largest of Kenya's coastal primates. This individual reaches my hip on all fours and swaggers under broad, bristly shoulders. Leaping up on to a wall embedded with broken glass, he sits, manspreading, and yawns to reveal his impressive canines.

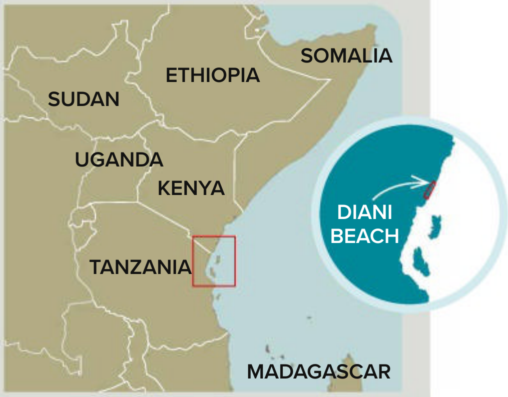
Inside the shaded B&B garden, a group of vervet monkeys combs the grass for food. Tiny infants are wrapped around their mothers, their fingers splayed spiderlike around their backs, while juveniles playfight and graze. A monochrome blur catches my eye. Three Angolan black and white colobus monkeys – two adults and a youngster – bounce along the boundary wall to a flowering flamboyant tree. They have a cape-like mantle of flowing white fur fringing their glossy black shoulders. With matching coiffed

BEACH COTTAGE: GORAN TOMASEVIC/REUTERS; MOTHER AND BABY: ROLAND SEITRE/NATUREPL.COM; AERIAL VIEW: DIY13/GETTY

### ABOUT THE AUTHOR

Beth is a freelance nature and travel writer with a particular interest in conservation. She visits Kenya regularly, often taking volunteers to support community projects.

## Where is Diani Beach?



Diani is 30km south of Mombasa on the southern coast of Kenya. Its beautiful sandy beach and the warm waters of the Indian Ocean have put it on the map since the 1970s. But its development has seen huge areas of coastal forest cleared.

sideburns and long, tufted tails hanging straight beneath them like light pulls, they are strikingly beautiful. They perch silently, watching the enthusiastic holidaymakers gathering beneath them, cameras poised. These are the rarest of the coastal primates, the last population in Kenya – fewer than 400 remain.

> “They perch silently, watching the holidaymakers gathering beneath them, cameras poised”

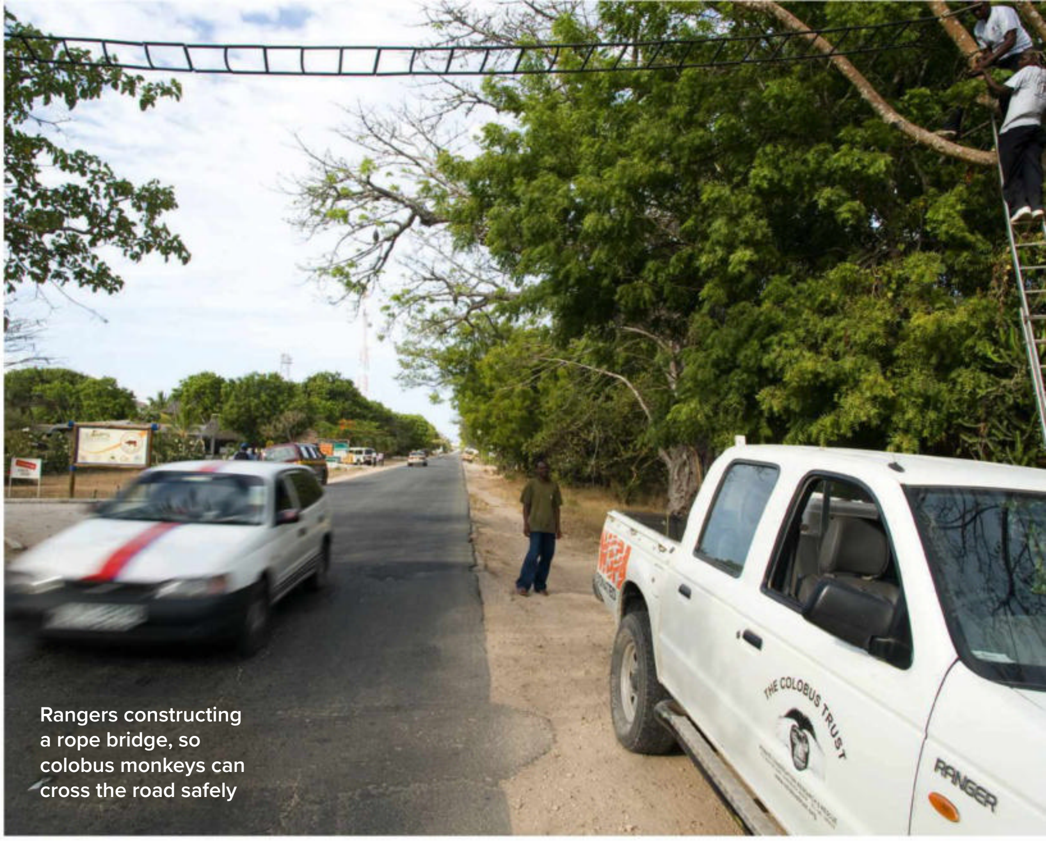
As though in shifts, high-pitched staccato chirps signal the arrival of Sykes' monkeys. The first one plops on to the lawn, quickly followed by the rest of his troop, all flecked iron-grey with snowy bibs. The bartender hands a long stick to a couple sunbathing by the pool. The next day, when I am occupying the same sun lounger, I understand why: it's clearly the ambush zone.

In a blink, a male makes a dash towards me and snatches a packet of peanuts. Squawks of excitement echo around the group, but the thief is not about to share his spoils and the others resign themselves to a more conventional meal of grass. Youngsters play hide-and-seek around the base of trees, while one individual sips drips of condensation from the outlet pipe of an air-conditioning unit.

Seeing four of the area's five resident primate species in less than an hour – the fifth, the galago, or bushbaby, is nocturnal – it would be easy to assume they are thriving on Kenya's popular south coast. But a darker truth explains the apparent abundance of these monkeys. And the bartender's stick hints at a growing problem. The reality is that these primates have no choice but to live here.

Diani lies within the remnants of East Africa's coastal forest, a unique ecosystem rich in endemic species and the primates' natural habitat. It's a globally recognised biodiversity hotspot that once stretched uninterrupted from southern Somalia to Mozambique yet, following decades of deforestation, only 20 per cent remains in fragmented patches. The primates have become squeezed into ever smaller spaces, giving the false impression that numbers are healthily high. Nicole Englefield lives in one

Broken glass stuck into a wall does not deter a yellow baboon from climbing over



Rangers constructing a rope bridge, so colobus monkeys can cross the road safely

## Building bridges

**Over its lifetime, a ‘colobridge’ can be used more than 32,000 times. To ensure these vital pathways remain safe and functional, regular maintenance is essential. Staff from Colobus Conservation routinely inspect the bridges for signs of wear, damage or termite infestation. Repairs – such as realigning runners or replacing rotten poles – often require the entire structure to be lowered to the ground for proper restoration. Nancy Mungania, general manager at Colobus Conservation, underscores the importance of community involvement: “Traditionally, we were not raised with a conservation mindset or a clear understanding that deforestation impacts humans as well as wildlife. Many people didn’t grasp how deeply connected we are to nature, or the critical role wildlife plays in maintaining a healthy ecosystem. That’s why education is essential. It fosters awareness and empowers communities to become active protectors of their environment.”**

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of the oldest houses in Diani, where she runs a small business of luxury beachfront suites from her 1.2 hectare property. Her house was built before the rise of tourism, and her garden remains a haven of native plants and ancient trees that attract all five primates. “From the beginning, it’s been important to us to avoid overdevelopment,” she says. “We’ve been careful to leave much of the land untouched, preserving the space for wildlife.”

THE TRANSFORMATION south of Mombasa began in earnest when the Diani Beach Road was built in 1971. The beautiful broad, white sands of Kenya’s south coast opened to tourism, attracting a growing number of both domestic and international visitors, and the once dense forest became prime real estate. As rows of new hotels, resorts and houses sprung up along the beach, Diani became a tourist trap for people and a death trap for primates. The loss of forest threatened their food sources and severed their canopy-level commuter routes, forcing them to make risky road crossings at ground level or along overhead cables to find food, water and places to sleep.

DO NOT FEED THE MONKEYS

Despite the signs, tourists often feed wildlife

Unable to navigate the new infrastructure, monkeys were hit by cars and electrocuted on powerlines.

Angolan colobus monkeys, being mainly arboreal, were particularly vulnerable. These animals rarely come to the ground and have no traffic sense compared to their terrestrial baboon cousins, who are far more streetwise, even known to look left and right before crossing the road.

Casualties hit an all-time high in 1996, prompting a community outcry. In response, Colobus Conservation was established to rescue and rehabilitate sick and injured animals, raise awareness and develop strategies to protect local primates.

According to the charity, 20 per cent of callouts are to monkeys involved in electrocutions, while traffic collisions injure 55 monkeys on average every year. The dry season is particularly dangerous, as dying foliage reduces food availability and canopy cover, pushing the monkeys to take greater risks in search of sustenance.

You don’t have to wander far to see the improvements Colobus Conservation has made to keep monkeys out of harm’s way. Brightly painted speed humps and ‘Colobus

BROKEN GLASS AND ROAD BRIDGE: ROLAND SEITRE/NATUREPL.COM; TREE SIGN: CHARLES TOMALIN/ALAMY

Conservationists are often called out to injured monkeys

COLOBOLOGIST
Eco-Volunteer
www.colobustrust.org
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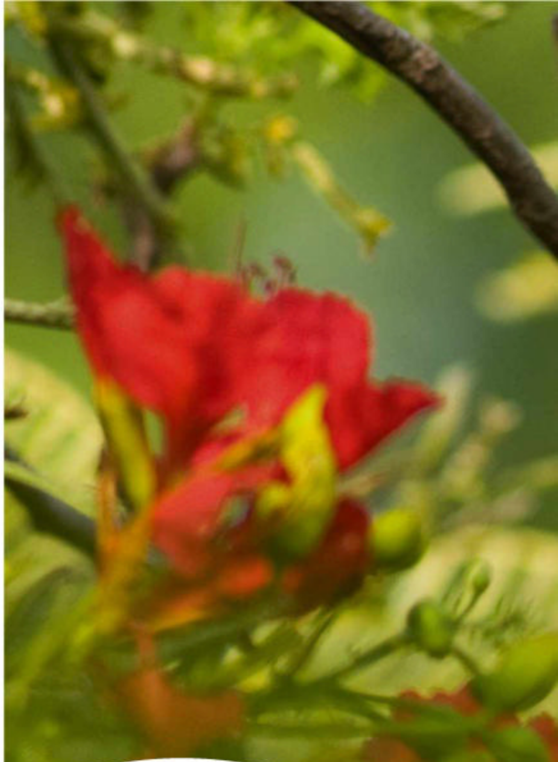
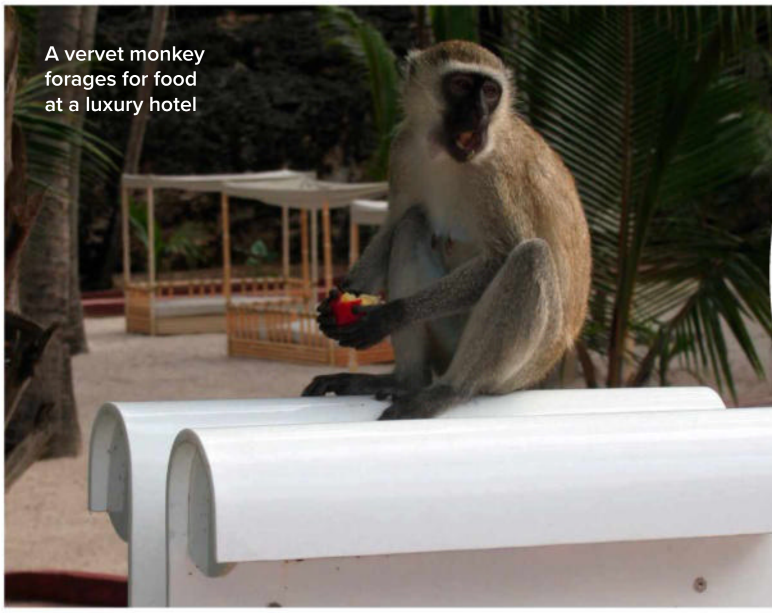
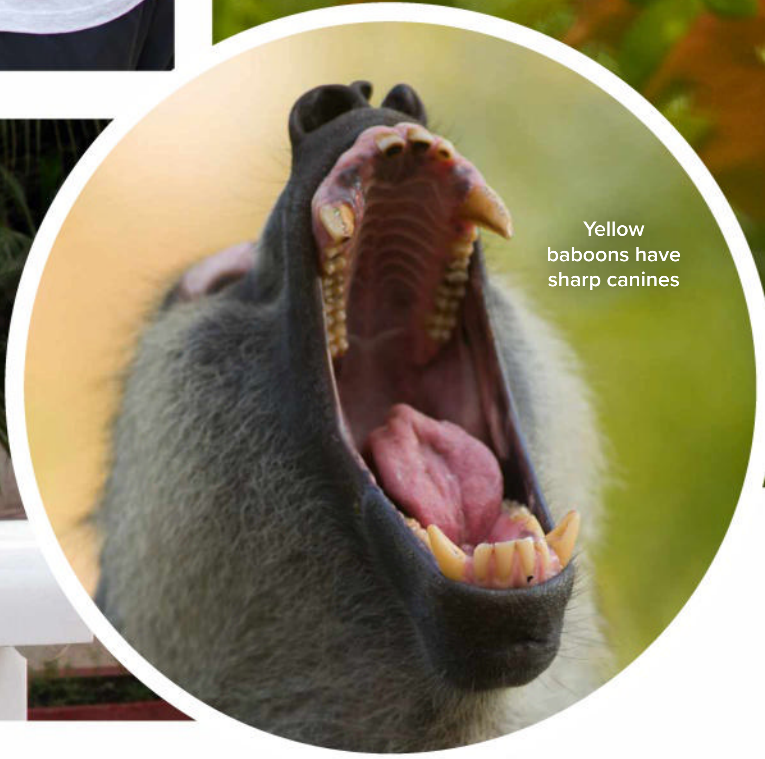



A vervet monkey forages for food at a luxury hotel


Yellow baboons have sharp canines

Crossing' road signs have slowed drivers down, while specially designed 'colobridges' – simple yet ingenious chain ladders covered with tubing – hang above Diani Beach Road in accident hotspots. These simple structures provide safe passage through the canopy, helping to prevent accidents and ensuring sub-populations stay connected to maintain healthy gene flow.

A short tuk-tuk ride to Colobus Conservation HQ at the quieter, southern end of the town reveals the extent of the charity's education programmes for community groups and schools (1,000 children attend workshops a year). For a small fee, tourists can visit the rehabilitation enclosures, information centre and tree-planting scheme, and may even catch a glimpse of the resident colobus family. One of Colobus Conservation's most significant victories came in 2017, when the charity successfully lobbied the Kenya Power and Lighting Company to insulate about 12km of powerlines and relocate transformers from primate electrocution hotspots. The organisation is also planting a corridor of native trees linking primate habitats along a 15km stretch of coast from the Kongo River, north of Diani.

Annual censuses keep track of primate populations, and recent data is promising. However, these figures do not necessarily tell the whole story, as many primates have been displaced by ongoing development in neighbouring areas. One major project – the Dongo Kundu Bypass – connects Mombasa to the south coast via a 17.5km highway and a series of bridges. Seen by authorities as a milestone in national infrastructure, the first phase opened in August 2024 and is already boosting tourism in Diani. It's welcome news for the local economy but the cost to wildlife is yet to be seen.

More roads, more cables and more human encroachment all threaten to tip the balance of conservation efforts, while climate change is exacerbating the problem. Failed rains and rising temperatures are putting both people and primates under pressure. When drought kills their crops, farmers look to the remaining forest for food. In desperation, some risk prosecution and

A colobus eats hibiscus flowers in a tree

“More roads, cables and human encroachment all threaten to tip the balance of conservation efforts”

set illegal snares to trap wildlife, including monkeys, for bushmeat.

“Diani’s remaining natural habitat is disappearing at an alarming rate, and unless urgent action is taken, the next three years could mark a critical tipping point for the region’s primates – particularly the vulnerable Angolan black and white colobus,” says Nancy Mungania, the general manager at Colobus Conservation. “Rapid development continues to degrade the forest, threatening the biodiversity.”

Nancy and her colleagues are particularly concerned about the threat to primates from large new infrastructure projects. They are working with the Kenya Power and Lighting Company to find long-term solutions for the higher voltage powerlines that can’t be insulated in the same way as those in Diani. New monkeys arriving in Diani are likely to join the ranks of those already successfully eking out an existence alongside humans. As Nancy says, “Those that adapt, succeed.” The more audacious species with broader diets have been quick to exploit the benefits of coexisting with people, often found foraging from bins, raiding restaurant tables and sneaking through open hotel windows to ransack bedrooms.

Unsuspecting tourists make for particularly easy pickings – as I myself experienced when I lost those peanuts. Signs advise against feeding wildlife, yet guests often ignore them, entertained by the monkeys’ antics. With the primates becoming bolder and more enterprising, hotel and restaurant staff now go about their daily duties armed with catapults – the sight of which is usually enough to deter even the most persistent opportunists.

Not all the primates are mischief-makers, though. The gentler colobus monkeys have no interest in human food, sticking to their treetop diet of leaves, seeds and flowers.

FOR NOW, UNDER THE WATCHFUL eye of the local community, Kenya’s south coast primates continue to survive on the edge of human life. But their future hangs in the balance. The region’s last pockets of forest are shrinking, and the next few years will be critical, especially for the Angolan black and white colobus monkey. Whether Diani becomes a model for coexistence or a cautionary tale of unchecked development depends on the choices made today.

As I admire a colobus family watching silently from among the flowers in a tree above the beachgoers and cameras below, it’s clear: they’re still here. But for how much longer? Ⓦ

MONKEY CRATE, YELLOW BABOON AND EATING FLOWERS: ROLAND SEITRE/NATUREPL.COM; HOTEL: ADAM JAMES/ALAMY

# A journey into sound

## Progressive hearing loss prompted a memorable quest to absorb nature's calls and choruses

*By* **NEIL ANSELL** *Illustration by* **SUNNU REBECCA CHOI**

I AM CAMPED HIGH UP AMONG THE crumbling volcanic peaks of the Isle of Rum, in the Inner Hebrides, sheltering in my tent from dense clouds of the hungriest midges I have ever encountered. As darkness falls, the fur of midges covering my tent begins to disperse a little, and I venture out still higher, find a spot to sit, and wait.

There is total silence; the mountains seem utterly lifeless. There is no moon and the darkness is almost total. For a long time nothing happens and I start to worry that I have come to the wrong place, or that I have left it too late in the season. But then I think I hear something far off and faint, at the very limits of my hearing. And a moment later they are all around me, whooshing past my head, invisible in the dark, and calling four quickfire calls. The dark mountain suddenly turns from tranquillity to tumult. Manx shearwaters are flying in in their thousands. They nest in burrows high in these hills and only come ashore at nighttime, after a day of fishing possibly a hundred miles out at sea. The colony on this Scottish island is home to perhaps a hundred thousand pairs, a third of the entire world population. There is layer upon layer of sound; those nearby ring out pure and clear, while beyond them is a constant chatter like a room full of people at a party all talking at once. And beyond even that is a wave of muttering, as if the entire mountain has come to life. It is an overwhelming experience – individually, their calls may sound harsh and discordant, but as one they sound to me like a choir of angels. This is the final species I have sought out this year, creatures I really want to hear while I still can.

When I walk in the woods, I can no longer hear the birds singing. Perhaps with my hearing aids turned up to their highest, I will hear a few little stabs of sound, just a shadow of what must truly be there. My hearing has always been an issue for me; childhood illnesses left me profoundly deaf in one ear and hard of hearing in the other and, on reflection, this has shaped many of the choices I have made in life. I always preferred to socialise on a one-to-one basis, where I could reinforce my limited hearing with a little light lip-reading. Group activities, from school to many working environments to social gatherings, always quickly drained me of energy due to the intense effort of having to try to keep up with everything that was going on around me. Starting early in my childhood, I found my relief by embarking on solitary walks out in the woods and fields near my home, or from watching the birds on the nearby marshes. The natural world invites your attention, without ever demanding it.

THAT SENSE OF NATURE BEING restorative, of it being the place where I am most at ease, and most my true self, has remained with me throughout my life. But as I have grown older, I have found that my hearing has continued to deteriorate further, at an alarming pace. This progressive hearing loss affects both high and low notes, as if I am retreating to a vanishing point somewhere in the middle of my limited range. Every season I find that something I could hear last year is now no longer with me, as if it has simply winked out of existence. I have had a lifetime's practice at finding workarounds, both practical and psychological; I had convinced myself that appreciation of the natural world was overwhelmingly a visual matter, that sound was an occasional insignificant extra that added little to the

### ABOUT THE AUTHOR

Neil lives in a cabin in Scotland's Western Highlands, and spends most of his free time on solitary walks in the wilds. His latest book is *The Edge of Silence: In Search of the Disappearing Sounds of Nature* (Birlinn)

experience, and that my steady descent into silence would be no great loss, in the greater scheme of things. I am relentlessly positive by nature, and it has always been my inclination to see things, even the challenges I face, in the best possible light.

All this changed one winter's day on the shore near my home in the Western Highlands of Scotland. It was the calmest of days, windless and clear, and the still waters reflected the snow-capped mountains across the loch. I sat on a rock to watch great northern divers busily fishing and preening. These elegant birds come here every winter from their nesting grounds in Iceland, and I often find myself walking the shore and sitting with them for a while. But this day would be different, for it was then that I heard for the first time their incredible, otherworldly wail that is the stuff of legends. It felt like the most extraordinary sound I had ever heard in my life, and it shook me to the core. It forced me to acknowledge that not all was lost; not all birds are songbirds, and not all calls are song. There were still some remarkable sounds of nature that I might just be able to hear – if not for much longer – if I only made the effort to track them down, and was able to find myself close enough to overcome my limitations.

The moment I had this realisation, it began to feel like an imperative, an act of resistance. I would not go quietly into that good night; rather, I would go down fighting. It seemed like a matter of some urgency, something that I had to do right away, for who knew if these sounds would still be accessible to me if I was to put things off for another year?

And so began my season of sound. I put together a wish list, mostly but not exclusively of birds. It was not so much a list of species as a list of specific calls that are celebrated or even notorious. They had to be sounds that I had never heard before, and the reason I had never heard them was usually because the animals that produced them were rare and elusive or lived in the most out-of-the-way places. Songbirds were off the list, as it was too late for them; I was thinking more of the big stuff – shorebirds and seabirds and gamebirds such as greenshank, snipe and whimbrel, Manx shearwater, puffin and storm petrel, divers and grebes and bittern, black grouse and corncrake and ptarmigan. I added to these the nighttime chorus of the natterjack toad and the whistling of the otter, which I would only hear if I was able to get unfeasibly close. Many of the calls I was after were specific to a short breeding season, so I would have

> “Who knew if these sounds would still be accessible to me if I was to put things off for another year?”

> "The evocative calls felt integral to the soundscape and the spirit of the wild places they call their home"

to not just make my way to the right place, but be there at the right moment in time. I began to pore over bus and ferry timetables, and make detailed plans for the coming months, in a way that was most unlike my normal practice. My habit has always been to just wander out into the wilds with no clear destination in mind, and see what crosses my path.

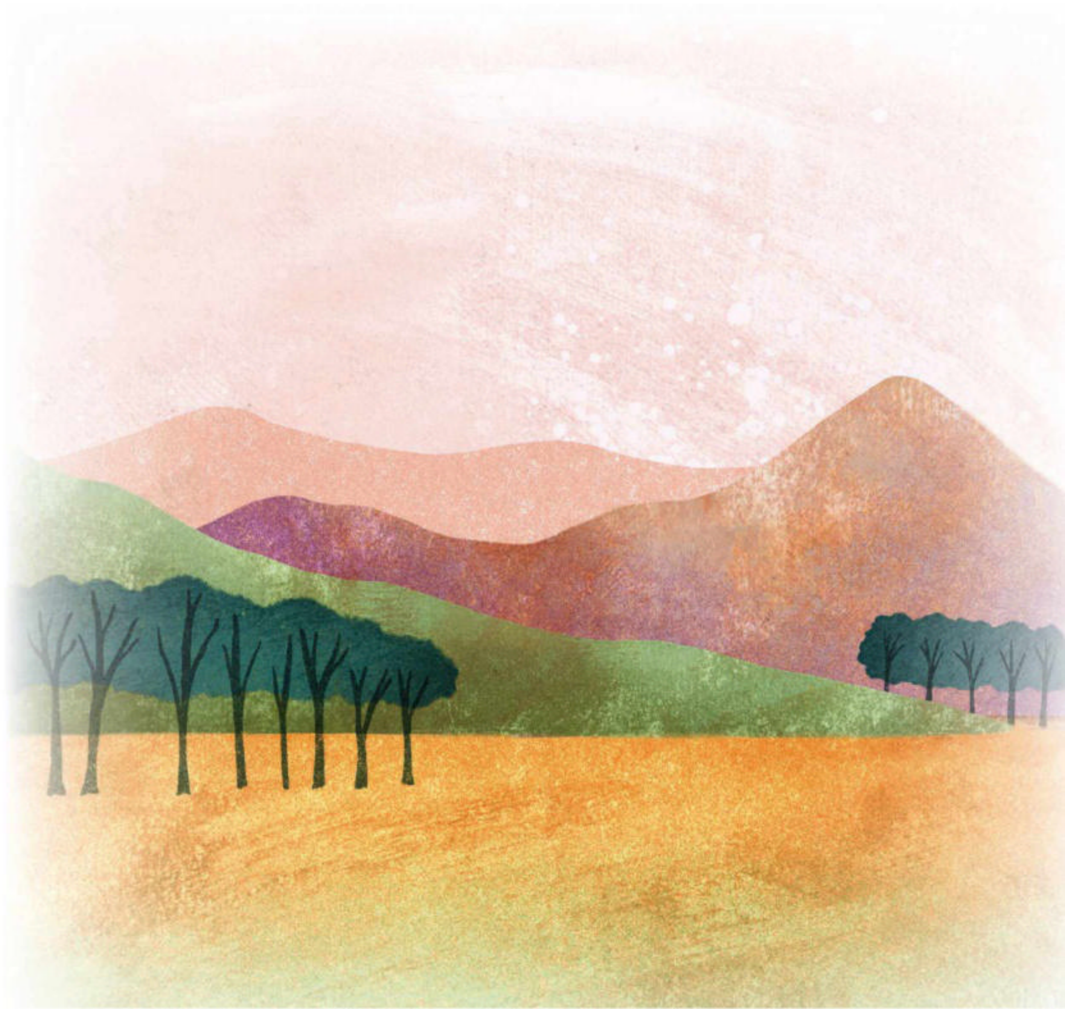
Over the coming months I crisscrossed the Highlands and islands of Scotland on public transport, with ventures away to North Wales and to North West England. My travels took me far out into the hills, to mountaintop and marsh, and to the storm-lashed shores of numerous isles. There were long treks, times when transport failed me and I had to hitchhike, and dozens of nights spent wild camping. Some of the calls I heard were utterly beautiful, such as those of the waders, while some were frankly ridiculous, such as the strange mechanical calls of storm petrels from within their rocky hideaways, or the maniacal laughter of the red-throated diver. But all were immensely evocative and felt integral to the soundscape and the spirit of the wild places they call their home, so that their absence would leave the landscape hollowed out and somehow barren.

It struck me that the reason I had not previously encountered and heard some of these species is because their numbers are in steep decline, and it is not just me that is in danger of losing their calls forever, it is everyone. Yet it was not always the rarest species that were the most challenging to find. With some species, such as the corncrakes on the Hebridean machair, the bitterns in their reedbed redoubts, or the black grouse displaying on their lekking sites, it was simply a matter of finding out where the last few of these birds still gathered, making my way there when the time was right, and waiting. More of a challenge were those species that do not gather in clusters, but rather are thin on the ground, spread over a huge range.

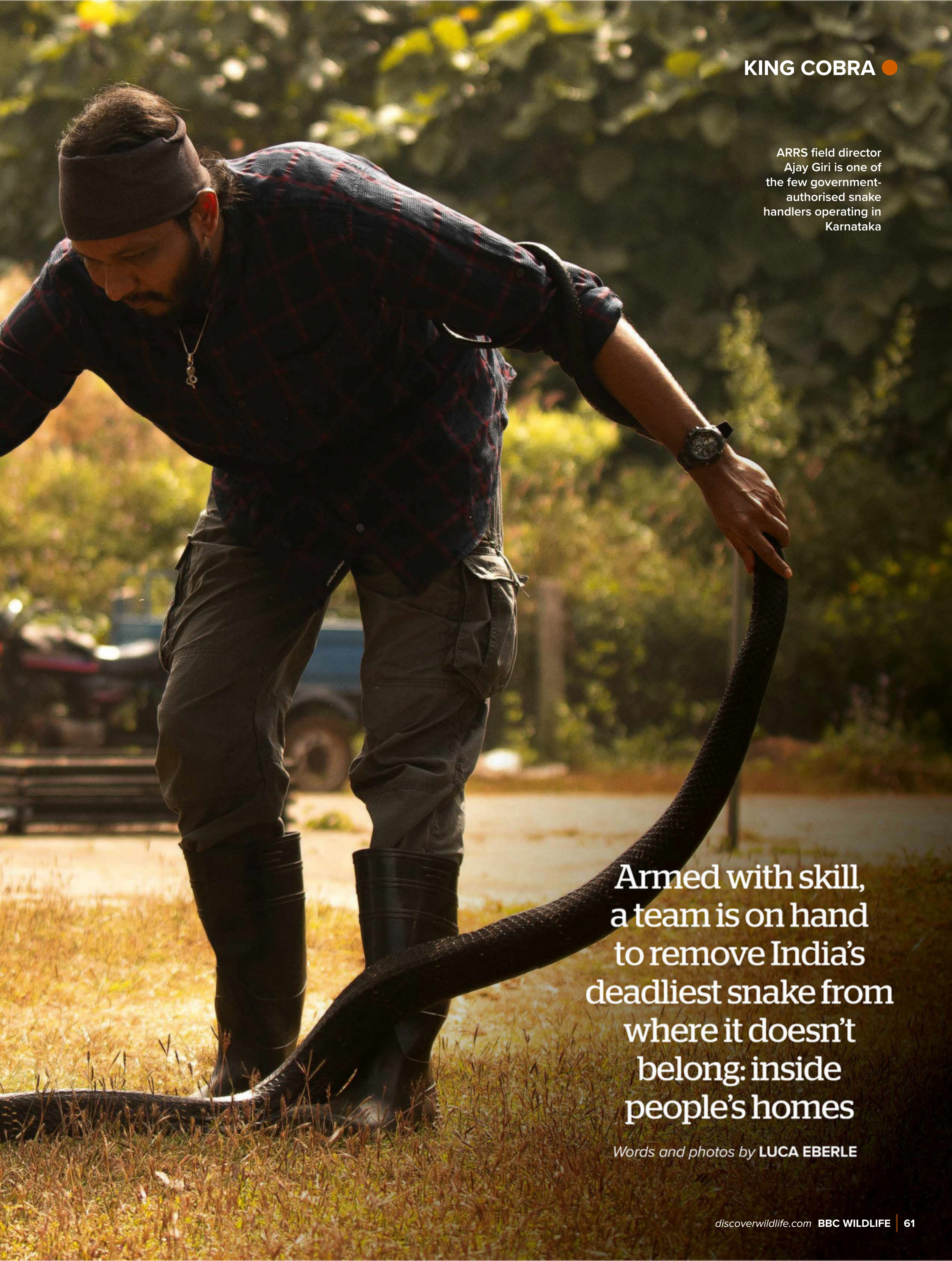
The greenshank is one of my favourite birds, a pale, elegant wader whose nesting sites are notoriously elusive. There are only a thousand or so pairs of them, and they nest widely scattered across the flows and bogs of the uplands of the Scottish Highlands. I knew they were present on my home turf, for they would gather on the shores nearby before and after breeding. At the shore they were remarkably vocal, with a vast range of calls, but it was not these calls I was after. Rather it was their song-flight, spoken of in awe by those few who have had the good fortune to hear it. The birds share nesting duties and tend to change guard at dawn and dusk, and this is when you have a chance of being present for this elusive display. My only option was to track the bird down to its nesting grounds in the hills, and camp out alongside them.

I set out on a sunny spring day with my tiny tent and hiked deep into the mountains until I came to what felt like the perfect location, the kind of place that I would choose to call home if I was a greenshank. A shallow lochan on a high, exposed ridge surrounded by peat hag, with an expansive view over the neighbouring mountains to the shining sea beyond. A good sign was the golden plovers calling from the heather-clad ridges of peat. This bird, too, has a beautiful, haunting call, and it would undoubtedly have made my list had I not heard it before.

At first light, I awoke to a torrent of song directly above me. I put in my hearing aids and crept quietly out of my tent. The bird was flying in a broad circle that encompassed the whole of the ridge-top, rising and falling, towering and plunging, and not for one moment letting up in that delirious, emotive song that set the mountains ringing. It was the most truly songlike of anything I heard that year, a perfect reminder of all that I had lost, but pitched low enough to sit comfortably within my remaining range. As I watched, its mate flew up from their nest and joined the display, wing to wing. I did not wait for the song cycle to finish. Instead, I quickly packed down my tent and slipped away. I wanted to leave the scene with the birds in full flow as I did not know if I would ever hear them again. In my memory they are singing still.



# LIVING WITH THE KING



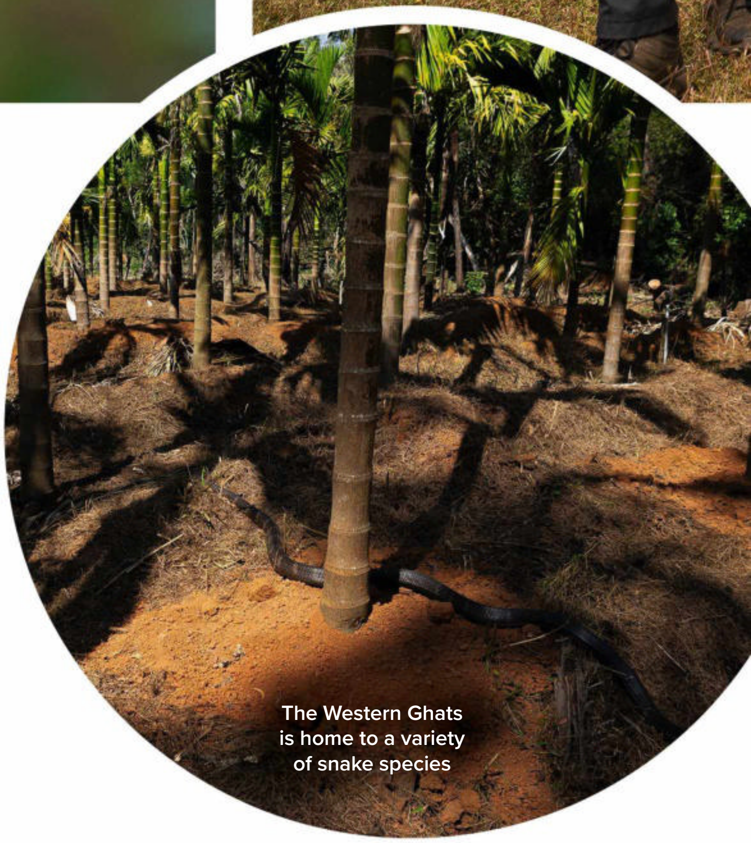
ARRS field director Ajay Giri is one of the few government-authorised snake handlers operating in Karnataka

# Armed with skill, a team is on hand to remove India's deadliest snake from where it doesn't belong: inside people's homes

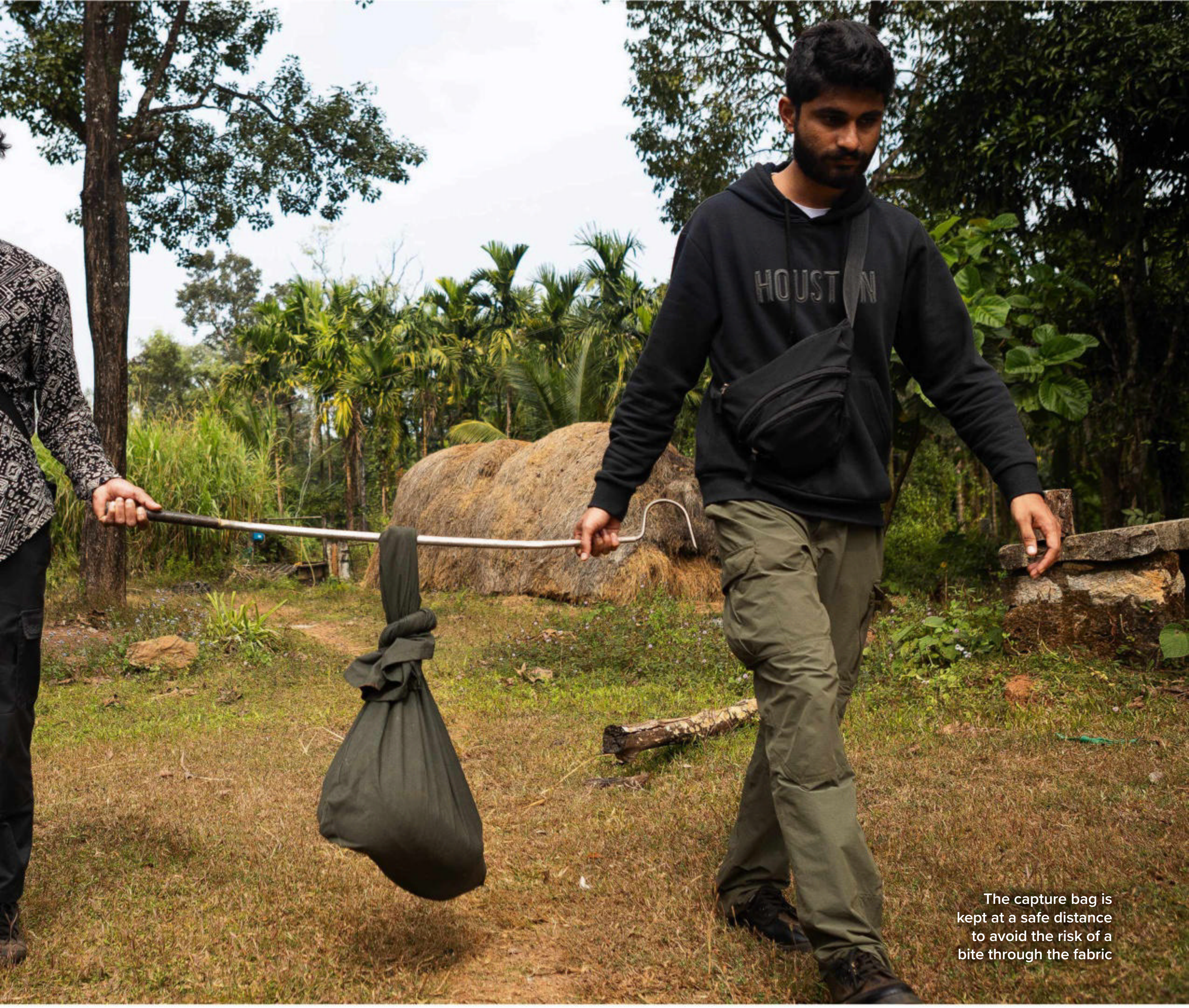
*Words and photos by* **LUCA EBERLE**

Cobra is the common name for elapids that can expand their ribs to create the well-known hood

IT'S A HOT NOVEMBER morning in the Western Ghats of southern India, and I'm sitting on a wooden verandah surrounded by dense forest. Suddenly, the shrill ring of a mobile phone breaks the silence.



The Western Ghats is home to a variety of snake species



The capture bag is kept at a safe distance to avoid the risk of a bite through the fabric

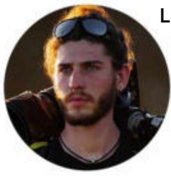
Ajay Giri, field director of the Agumbe Rainforest Research Station (ARRS), answers the call, concluding the conversation with a simple *sari*, meaning 'all right' in the Kannada language. "There's a king cobra near a school," he informs us. Joined by programme coordinator Rithan Bopanna and field assistant Abhilash Achar, we grab our gear, jump into the field vehicle and hit the dirt road.

ESTABLISHED BY RENOWNED herpetologist Romulus Whitaker, ARRS is a field station affiliated with The Madras Crocodile Bank Trust and Centre for Herpetology, near Chennai. Over the years, the station has become an authority on the Western Ghats king cobra (*Ophiophagus kaalinga*) – scientists here were among the first in the world to use radio telemetry to study this elusive species in the wild. In addition to research, ARRS staff routinely rescue and release king cobras that stray into settlements, contributing to both conservation and community outreach efforts.

We arrive at a small house and the owners lead us around the back. Ajay scans the underside of the roof with a torch until the wide scales of a king cobra reflect the light – it's coiled between the wooden beams. Meanwhile, Rithan and Abhilash position a capture bag against the wall as a group of curious children gathers nearby.

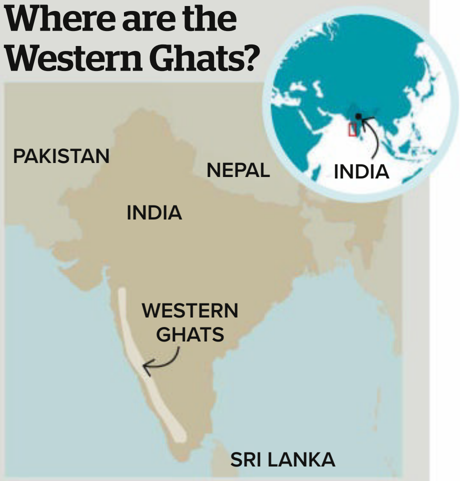
The retrieval only takes a few minutes. Ajay lifts the heavy snake from the roof cavity

## ABOUT THE PHOTOGRAPHER



Luca is an Italian naturalist and conservation photographer who investigates environmental challenges and human-wildlife coexistence. See more of his work at eberleluca.com.

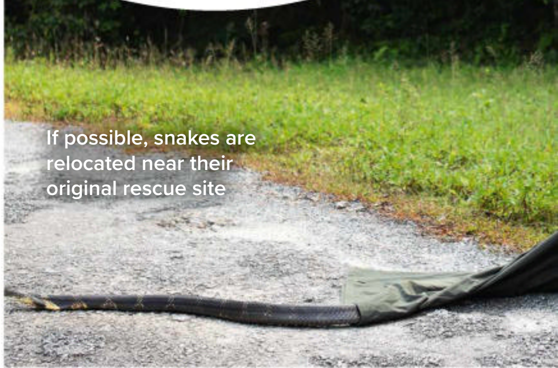
## Where are the Western Ghats?



The Western Ghats, also known as Sahyadri, is a forest-cloaked mountain range stretching 1,600km down India's west coast, from Gujarat to Tamil Madu.

Approach with caution: a king cobra can lift up to a third of its body off the ground

Data is collected to monitor movement and behaviour



If possible, snakes are relocated near their original rescue site

using a large metal hook, taking great care not to startle it or cause it stress. He grasps the cobra's tail with one hand, supporting its body with the hook, and gently 'walks' it towards the capture bag. The children remain silent, captivated by Ajay's skill.

A collective gasp escapes as the snake turns toward Ajay, flaring its hood – a typical defence tactic to appear larger and intimidate predators – before sliding into the bag. Rithan and Abhilash step in to secure the bag and tie it around the hook's shaft. The cobra is now safely contained and can be released nearby. "We always strive to find release sites in the vicinity, so that snakes are not relocated," Ajay explains.

Ajay has been working with king cobras for more than 17 years, and has rescued and released hundreds of individuals with support from the ARRS team. He has also handled numerous other venomous species, including the 'big four' – the Russell's viper (*Daboia russelii*), common krait (*Bungarus caeruleus*), saw-scaled viper (*Echis carinatus*) and spectacled cobra (*Naja naja*), all of which have a frightening reputation for fatal bites.

Unlike its big four cousins, the king cobra has a calmer temperament and rarely bites humans, yet Ajay takes no chances, conducting every step of the rescue and relocation with the utmost caution. Despite countless close encounters with snakes, he has never once been attacked. "If you receive multiple bites, it means you are not very good at your job," he says. "You should be proud if you've never been bitten while handling snakes."

We reach the release site a few minutes later. Following a precise protocol, Ajay opens the bag and the cobra slithers into the dense undergrowth. Abhilash and Rithan film the moment on their smartphones for

Ajay and his team talk to locals following every rescue

> “The ARRS team is committing significant resources to education in high-risk areas’

ARRS’s social media, a crucial platform for raising awareness about their services and preventing human-snake conflicts.

Venomous snakes are drawn to homes by the presence of rodents and domestic animals. “This makes them particularly dangerous in rural areas,” Rithan explains, as we pass a village nestled among rice fields on our way back to the field station. While effective antivenoms exist for the big four snakes, there is currently no specific antivenom for king cobra bites in India.

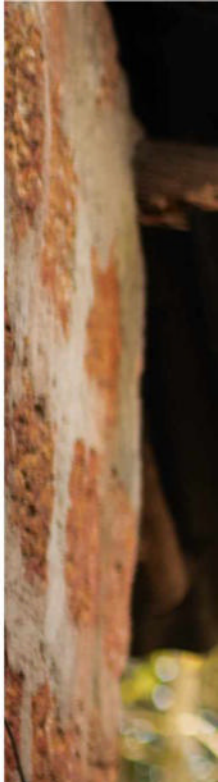
The king cobra is a beautiful and incredibly impressive reptile, often reaching 3-3.5m in length. It’s part of the elapid family, whose members are characterised by their permanently erect fangs. A top predator in its habitat, it usually ventures into human settlements in pursuit of other species, as it feeds primarily on other snakes – including its own kind. The behaviour gives rise to the genus name *Ophiophagus*, which means ‘snake-eater’ in Greek. The snakes can turn up in a variety of places, tucked away in toolsheds, plantations and even bedrooms, and the ensuing rescue missions can be challenging and exhausting.

The species is most active just before the rainy season, when the males roam in search of females and battle rivals for mating rights. This is when Ajay’s team are at their busiest, sometimes carrying out up to seven rescues in a single day.

The king cobra is unique – it’s the only snake species in India (and one of very few in the world) that constructs a nest for its eggs. The female builds a leaf-based structure on the ground, sometimes up to a metre in height, and lays between 15 and 40 eggs inside. She guards the nest diligently until the eggs hatch, helping to maintain the right temperature for incubation. Nests occasionally appear in human landscapes, and as such are closely monitored by ARRS researchers, both to study the species’ unusual parental behaviour and to reduce the risk of conflict with people.

IN INDIA, SNAKEBITES CAUSE MORE deaths than all other forms of human-wildlife conflict combined, with some 40,000 to 60,000 fatalities annually. For every death, there are another nine cases of severe injury or permanent disability. The World Health Organisation recently classified snakebite as a Neglected Tropical Disease and, in 2024, Karnataka became the only Indian state to recognise snakebite as a Notifiable Disease. This policy requires all snakebites treated in hospitals to be reported, which is a first and important step towards tackling the problem.

When threatened, the king cobra emits a hiss that sounds like a growling dog



## One king or four?

**In 2024, the king cobra underwent a dramatic taxonomic overhaul, becoming divided into four species: the Northern king cobra (*Ophiophagus hannah*); Sunda king cobra (*Ophiophagus bungarus*); Western Ghats king cobra (*Ophiophagus kaalinga*); and Luzon king cobra (*Ophiophagus salvatana*). The new classification offers deeper insights into the evolutionary history and ecological diversity of the king cobra, making protection easier in different regions. *O. kaalinga* and *O. salvatana*, now flagged as distinct, endemic species, may be at particular risk due to their limited range.**

Children imitate the cobra pose with their hands

Snakebite injuries are a minor issue in big cities, yet plague rural areas. They impact the lowest-income populations, and have a far greater socio-economic impact than many people realise. While other human-wildlife conflicts, which often involve large animals such as elephants or tigers, are mostly confined to protected areas, snakebites are ubiquitous and far harder to mitigate.

The snakebite issue is compounded by a lack of awareness among rural communities, leading to unsafe practices such as working in fields without decent footwear and walking around at night without torches. When snakebites occur, villagers often avoid seeking medical help and instead turn to local healers, who cannot treat venomous bites effectively. And even when victims do reach a hospital, antivenom may not be available.

Interestingly, antivenom may be less effective if produced in a different state. “Venom varies regionally,” Ajay explains. “An antivenom produced in northern India using local snake venom may not work as well in southern India, and vice-versa. The most common antivenom – the polyvalent – works reasonably well for the big four, but not for the other dangerous species, including the king cobra.”

The best approach, of course, is to avoid getting bitten in the first place. As such, the ARRS team is committing significant resources to education in high-risk areas. They carry out presentations in schools, using lively slides to engage their young audiences, and hand out flyers and talk to locals after every rescue.

It’s evening, and only Rithan, Mahabala (the cook), and I are left at the field station, enjoying a light supper while basking in the cool breeze. In the distance, the distinctive call of the Malabar giant squirrel gradually fades away, replaced by the haunting songs of owls and the rhythmic chirping of crickets. I’m taking in this beautiful nocturnal symphony when a call comes in from Ajay. A very large king cobra has turned up in a garden and bitten one of the family’s two dogs.

We jump on a motorbike this time, dodging potholes and weaving between cows lounging on the still-warm concrete. On arrival, we immediately spot the snake, high in a tree and likely startled by the pets. It’s a huge male, around 4m in length and, despite its bulk, it moves swiftly and gracefully among even the thinnest branches.

Ajay allows us to take a few photos, but as soon as the snake starts to descend, he quickly moves in to guide it down to the ground. Family members and neighbours nervously press themselves against the wall as the cobra is nudged towards the capture bag.

Ajay has successfully rescued hundreds of snakes without once being bitten

“In India, snakebites cause more deaths than all other forms of human-wildlife conflict combined”

Unusually, this king appears agitated and doesn’t seem keen to enter the bag. It turns toward Ajay, raising its head more than a metre high and spreading its hood wide. Its muscular body inflates and deflates rhythmically and it produces loud hissing sounds, while its forked tongue flicks rapidly to detect airborne molecules.

Ajay, though, can read this behaviour like a book. After a few attempts, he calms the snake and completes the capture. “This one is quite large,” Rithan says to Abhilash as they lift the sack. We pause to weigh it: 8kg; the team also scans its body with a small scanner until they hear a beep. The device has detected a PIT (passive integrated transponder) tag, fitted just below the skin, which indicates a recapture. This is not unusual, as kings often return to locations where they have previously found food.

In addition to PIT tags, researchers can also implant radio-trackers beneath a snake’s skin. These allow the animal to be followed using receiving antennae, even in complex environments such as secondary forests. Using this technology, scientists can track a cobra’s movements and behaviour, gain insights into how it uses its home range, and even detect its heart rate.

“Studying behaviour can help us prevent accidents and better understand a species that, through its presence, can reduce bites from other venomous snakes,” Ajay explains to the small audience gathered around him. Before leaving, we check on the dog. It had been bitten by a Russell’s viper, not the king cobra, but has been given antivenom and should recover.

After a few minutes drive, we pull up on a dirt road in a patch of forest. Ajay picks up the bag and asks everyone to step back. He carefully unties the knot and, with a gentle tap of the hook, encourages the snake to exit. Moments later, its coils begin to unroll and the sound of scales rustling against dry leaves pierces the quiet.

Finally out of the bag, the snake rises and turns towards Rithan and Abhilash, observing them for a few seconds as its tongue flicks rapidly in and out. It then turns away, disappearing into the forest where, a creature of both fear and reverence, it remains a vital piece of a rapidly changing ecosystem where growing urban sprawl pushes wildlife ever closer to humans – yet where humans, with the help of groups such as ARRS, are learning to coexist with these extraordinary creatures.

# THE BEST BOOKS OF 2025

## Great reads that make perfect Christmas gifts for wildlife lovers

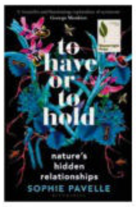
***BY* BEN HOARE**

### Is a River Alive?

By Robert Macfarlane
*Hamish Hamilton, £25*

THERE'S A MIC-DROP MOMENT NEAR the start of Robert Macfarlane's latest spellbinding work of non-fiction. He refers to "rivers who". At a stroke, his choice of pronoun gives life – personality even – to the flowing waters on which we all depend. Macfarlane then introduces us to the global campaign to grant personhood and legal rights to rivers and other natural entities, such as forests and mountains. He reveals how this highly radical but ancient idea can transform the way we think and feel about the more-than-human world, leading to better protection for the environment.

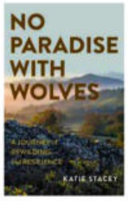
The book's wild, beating heart is an account of three journeys to magnificent river systems in Ecuador, India and Canada, all imperilled, in the company of the heroes battling to save them. The writing is urgent and deeply moving, and features thrilling descriptions of people and places, poetry and humour too. Unputdownable.



### To Have or to Hold

By Sophie Pavelle
*Bloomsbury, £20*

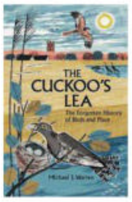
Parasites get star billing in Sophie Pavelle's chunky and detailed, yet refreshingly playful, investigation of symbiosis. This is a subject TV producers love, where different species forge close relationships, not always to their mutual benefit. But unlike the average TV documentary, Pavelle sidesteps easy explanations. There are surprises at every turn as she delves into wondrous and messy relationships involving a cast of unsung species that we tend to overlook, from lichens and rare hoverflies to parasitic barnacles and hairworms.



### No Paradise With Wolves

By Katie Stacey
*Collective Ink, £15.99*

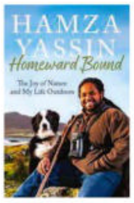
Katie Stacey tells the story of how she and her boyfriend Luke moved to northern Spain's verdant Asturias mountains to rewild a dairy farm. Cash is tight and locals are sceptical, wary of wildlife conservation in a region where wolves have long been persecuted. Undeterred, the couple stick at it, learning by trial and error. They are driven by a deep love for the land and an evolving vision of their little farm as both a family home and a thriving ecosystem for wild and domestic species. Wonderfully life-affirming.



### The Cuckoo's Lea

By Michael Warren
*Bloomsbury, £20*

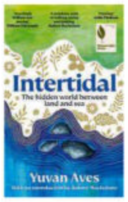
On the face of it, *The Cuckoo's Lea* is about the myriad ways in which birds have inspired English place names. But it's much more than that. Michael Warren is not only a superb nature writer but also a detective, who uses maps, medieval charters, parish records, Old English poetry and his own explorations to show how cuckoos and crows, owls and hawks, among many other birds, are woven into the cultural fabric of England. This is a phenomenal book that brings the past to life and makes you see landscapes anew.



## Homeward Bound

**By Hamza Yassin**
*Gaia, £22*

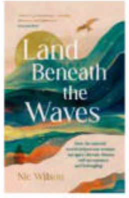
Every page of this warm-hearted cuddle of a book is full to the brim with the joy of nature. The genial Hamza Yassin shares anecdotes from his life as a wildlife camera operator and presenter, together with fascinating titbits on the natural history of various British habitats. His enthusiasm is infectious.



## Intertidal

**By Yuvan Aves**
*Ithaka Press, £22*

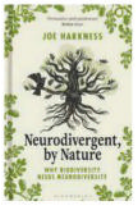
Yuvan Aves is a conservationist, activist and fantastic nature writer. *Intertidal* sees him mix observations of the people and wildlife of the urban coast in Chennai, India, with profound meditations on climate change, life and much else. Aves is the only author from south Asia to have been shortlisted for the prestigious Wainwright Prize – and, we hope, the first of many.



## Land Beneath the Waves

**By Nic Wilson**
*Summersdale, £18.99*

There's a simplistic notion that nature heals anything and everyone – but you won't find it in this beautiful and brave memoir. Nic Wilson has instead written a nuanced, painfully honest account of the day-to-day reality of living with chronic illness, showing the remarkable ways that nature helps her, without being a cure-all.

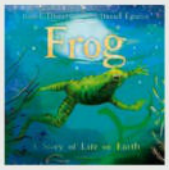


## Neurodivergent, by Nature

**By Joe Harkness**
*Bloomsbury, £18.99*

For his second book, Joe Harkness, a special educational needs teacher who himself has ADHD, thoughtfully recounts his experiences in nature and blends them with the insights of other neurodivergent nature lovers. He avoids the 'neurodivergence is a superpower' narrative. What emerges is complex and revelatory.

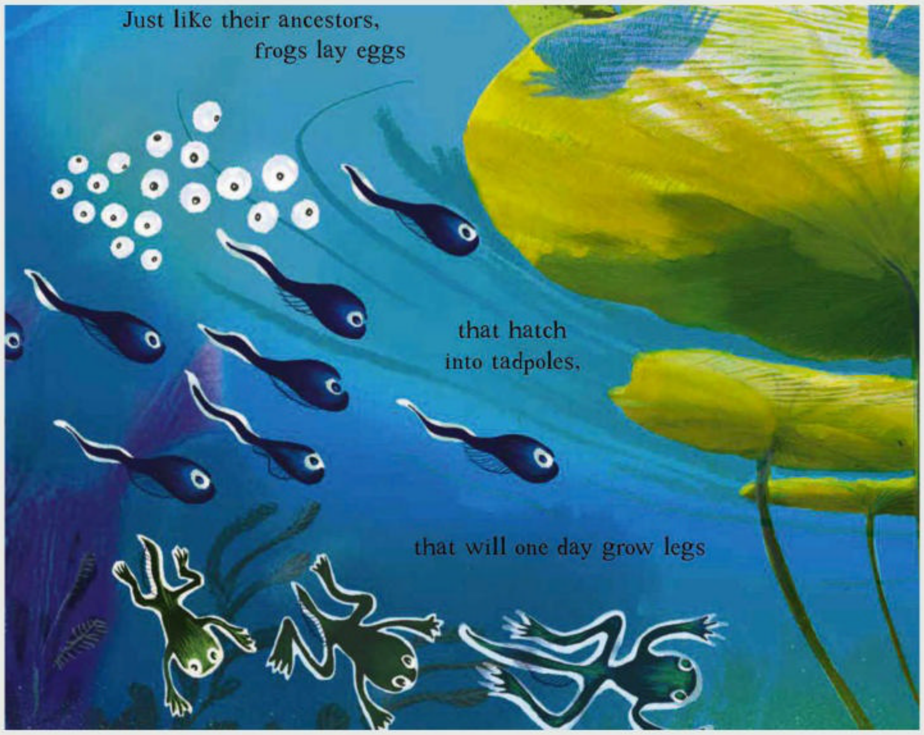
## CHILDREN'S BOOKS

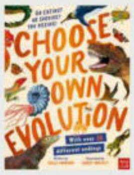


### Frog: A Story of Life on Earth

**By Isabel Thomas**
*Bloomsbury, £12.99*

EVOLUTION IS SURELY THE MOST AMAZING story of all, but among the hardest to tell well. And to engage five and six-year-olds with the complex mechanics of natural selection is harder still. Enter science writer Isabel Thomas. Inspired by a question her son asked – "If frogs come from eggs, and eggs come from frogs, where did the first frog come from?" – she has produced a stunning picture book that is nothing less than the story of everything. Each spread features dreamily immersive artwork by Daniel Egnéus and just three or four lines of text. Yet we are effortlessly whisked from the big bang to the emergence of living things and the evolution of animals until, finally, frogs leap onto the page. Readers are left with the thought that they, too, are part of the never-ending evolution story. Bound to become a firm favourite in primary school classrooms.

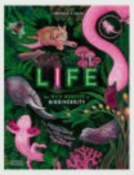




### Choose Your Own Evolution

**By Jules Howard**
*Nosy Crow, £14.99*

Science writer Jules Howard had the genius idea to turn the choose-your-own-adventure book format into this brilliantly compelling guide to evolution. Starting with the blob-like Dickinsonia, 570 million years ago, you decide whether to, say, develop a backbone, become nocturnal or take to the trees, before finding out if your chosen evolutionary path leads to extinction or you survive to the present. Beautifully illustrated by Gordy Wright and ideal for readers aged 7+. Evolution has never been this fun!



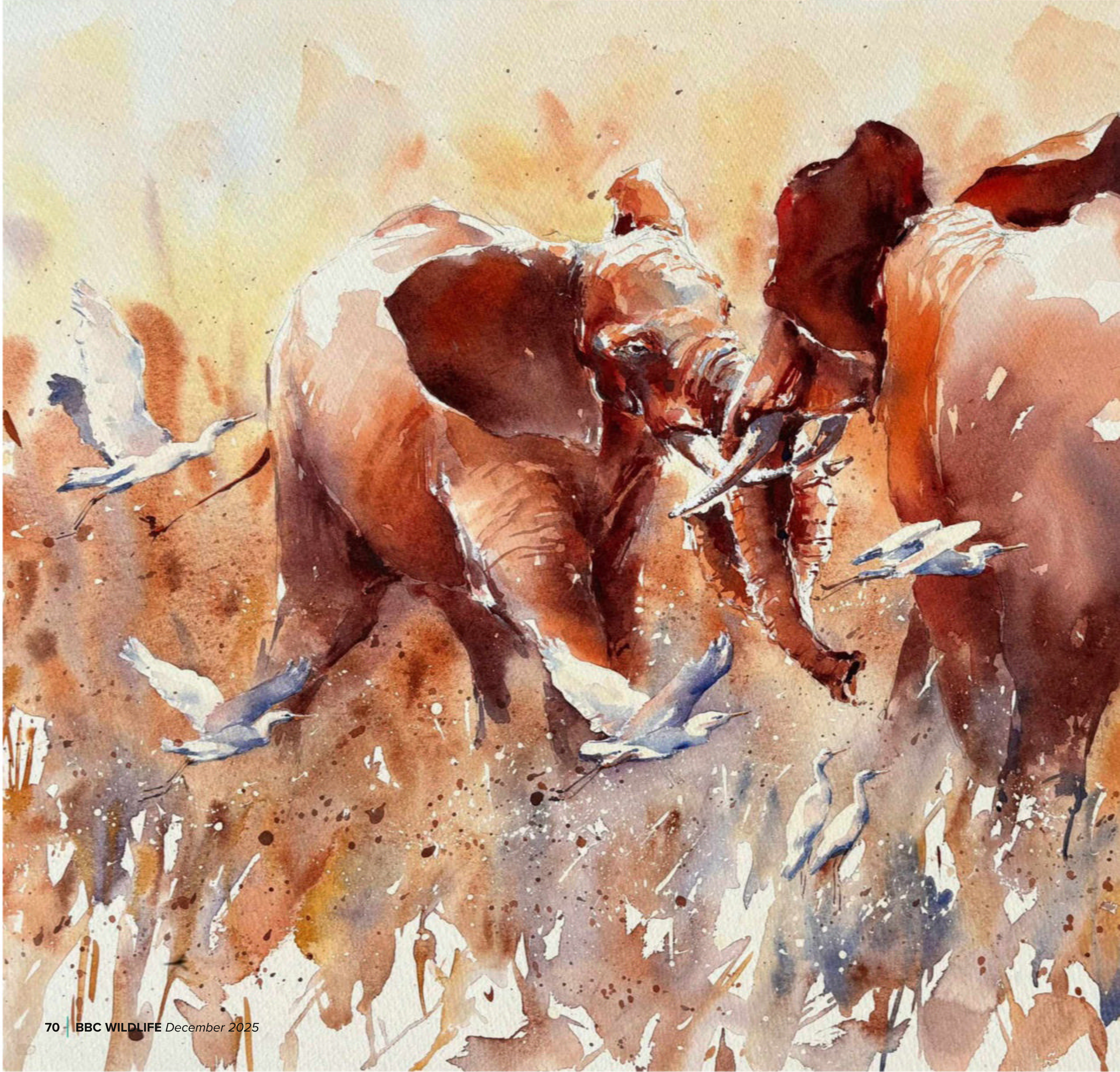
### Life

**By Jennifer N R Smith**
*Thames & Hudson, £16.99*

With sumptuous artwork by illustrator/author Jennifer N R Smith, this supersized book is one to pore over. The well-judged text breaks down the concept of biodiversity for readers aged 7+, introducing themes such as species adaptation, biomes, food webs and symbiosis. Like its predecessors *Glow* and *Bang* (about bioluminescence and volcanic activity respectively), *Life* uses neon ink, lending the book a celebratory feel that suits its subject. A gorgeous contemporary version of the treasures of nature of old.

RIVER AT SUNSET: ANTON PETRUS/GETTY

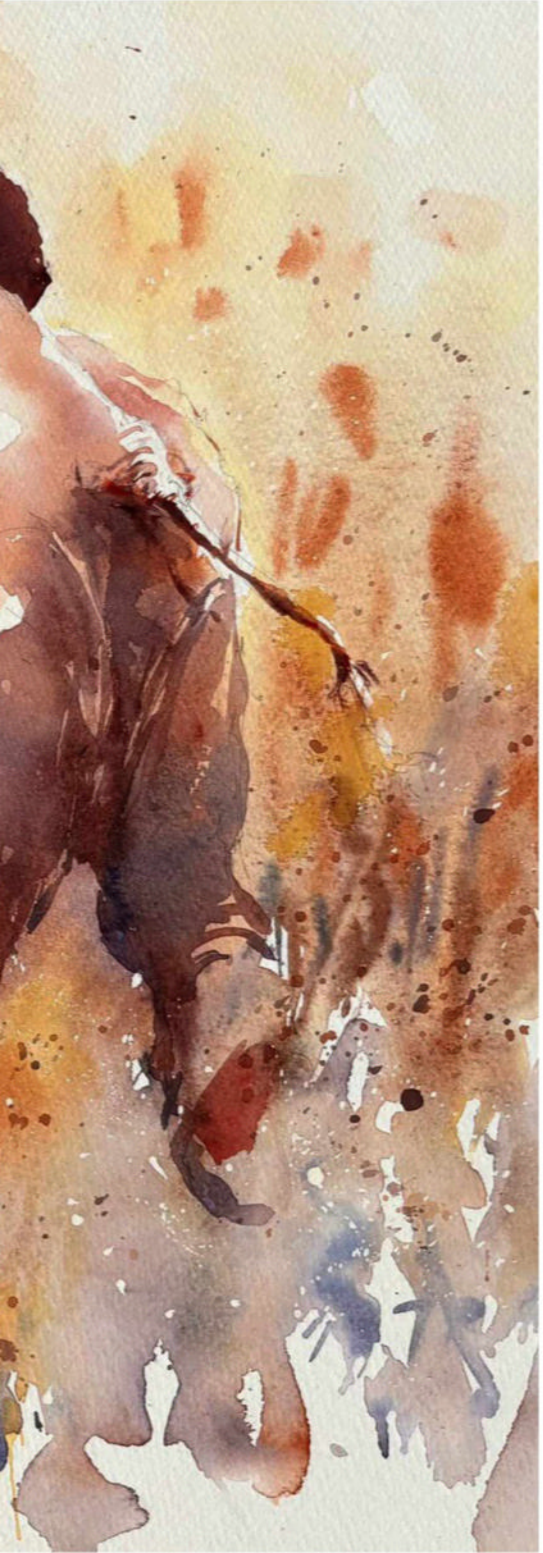
# VISIONS OF NATURE



# Celebrating the winners of Wildlife Artist of the Year 2025

Now in its 17th year, Wildlife Artist of the Year, organised by David Shepherd Wildlife Foundation, has grown into one of the world's leading art competitions, bringing together creativity, passion and purpose in support of global conservation. Each artwork is not only a striking celebration of nature but also helps raise vital funds for frontline projects that protect the species we love.

This year showcased exceptional talent, with artists telling urgent stories about our planet's wildlife and landscapes. From intimate moments to bold statements, every piece reminds us of the beauty we stand to lose and the power of art to inspire change. To see more from the competition, visit: davidshepherd.org



## Boys of Lolldaiga

**Julia Cassels**

*Winner: Elizabeth Hosking Watercolour Award*

*Medium: watercolour*

**JUDGES' COMMENTS:** "Inspired by young elephants playfighting on a dusty dam wall, Julia's watercolour bursts with energy."

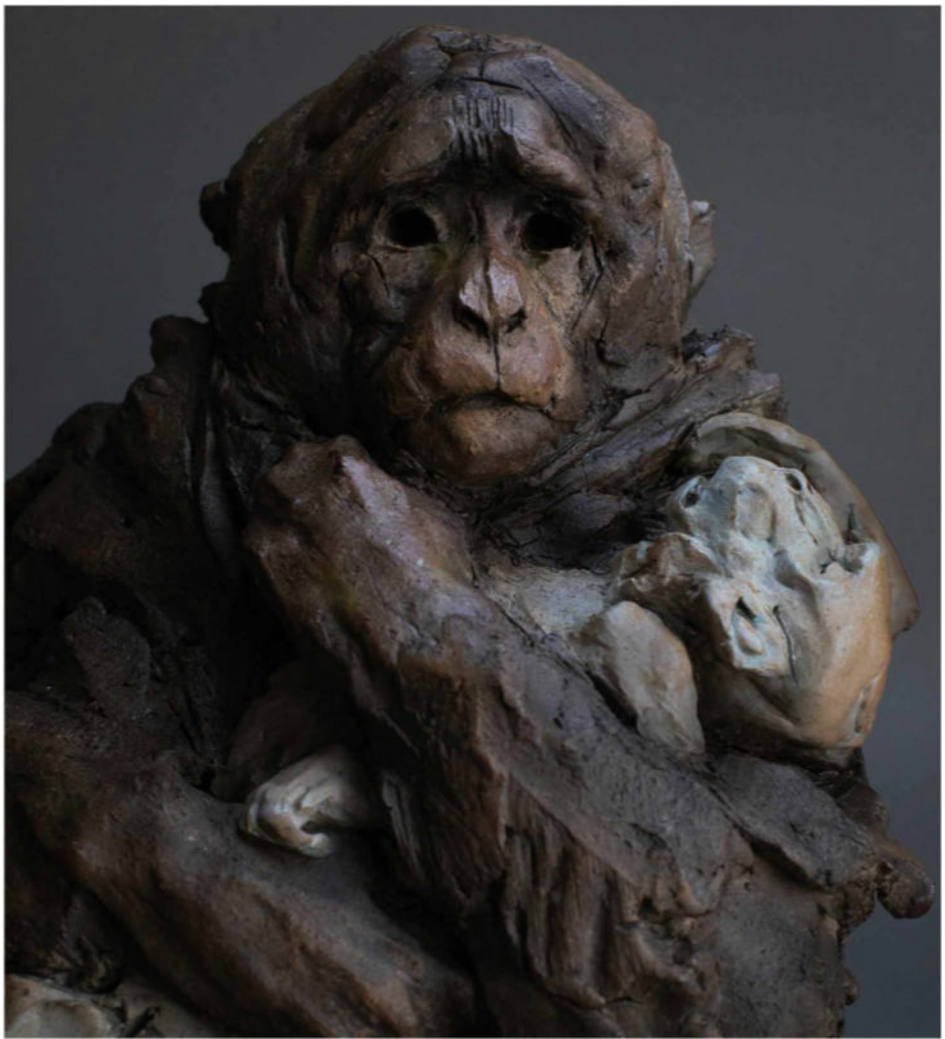
## Beloved

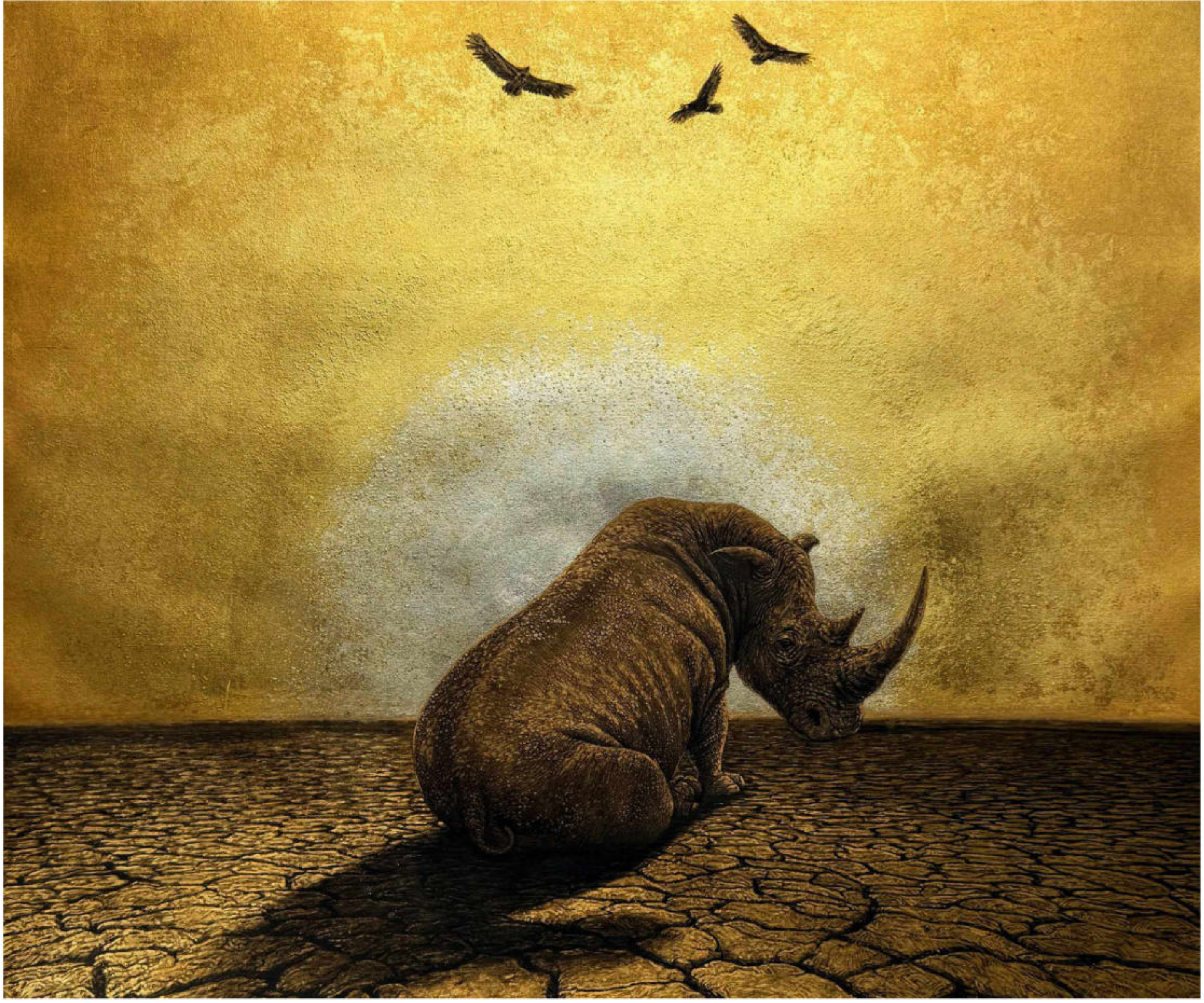
**Nicole Koleková**

*Overall Winner*

*Medium: ceramic*

**JUDGES' COMMENTS:** "Nicole's piece depicts a monkey mother unable to let go of her lost child, a heart-wrenching meditation on maternal love, grief and the fragility of life. Created using the rare technique of wood kiln-fired ceramics, it bears the unpredictable marks of fire and ash, echoing the wild essence of the subject itself."





## Waiting on the World to Change

**Matthew Polluck**

*Overall Runner-Up*

*Medium: ink, metallic paint, gold leaf*

**JUDGES' COMMENTS:** "A lone northern white rhino stands in desolation, its shadow missing the iconic horn stolen by human greed. Matthew creates a haunting image of extinction. His minimal palette and use of precious materials lend his work both immediacy and timelessness. His art is a call to action."

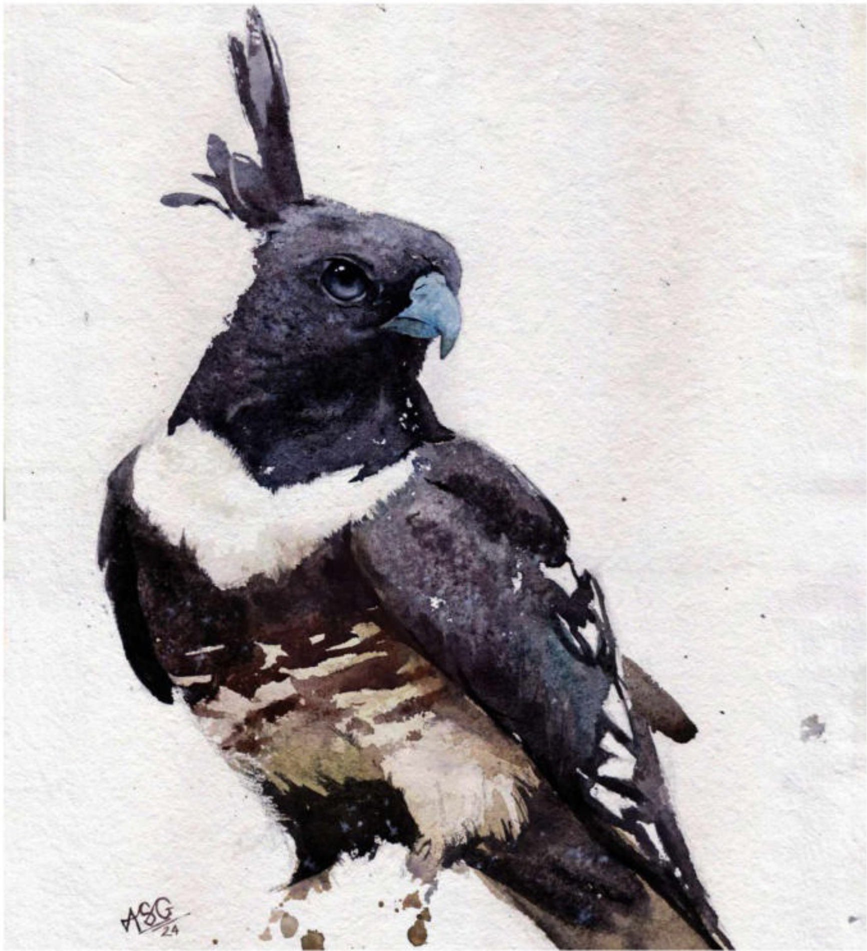
## Gentle Little Baza

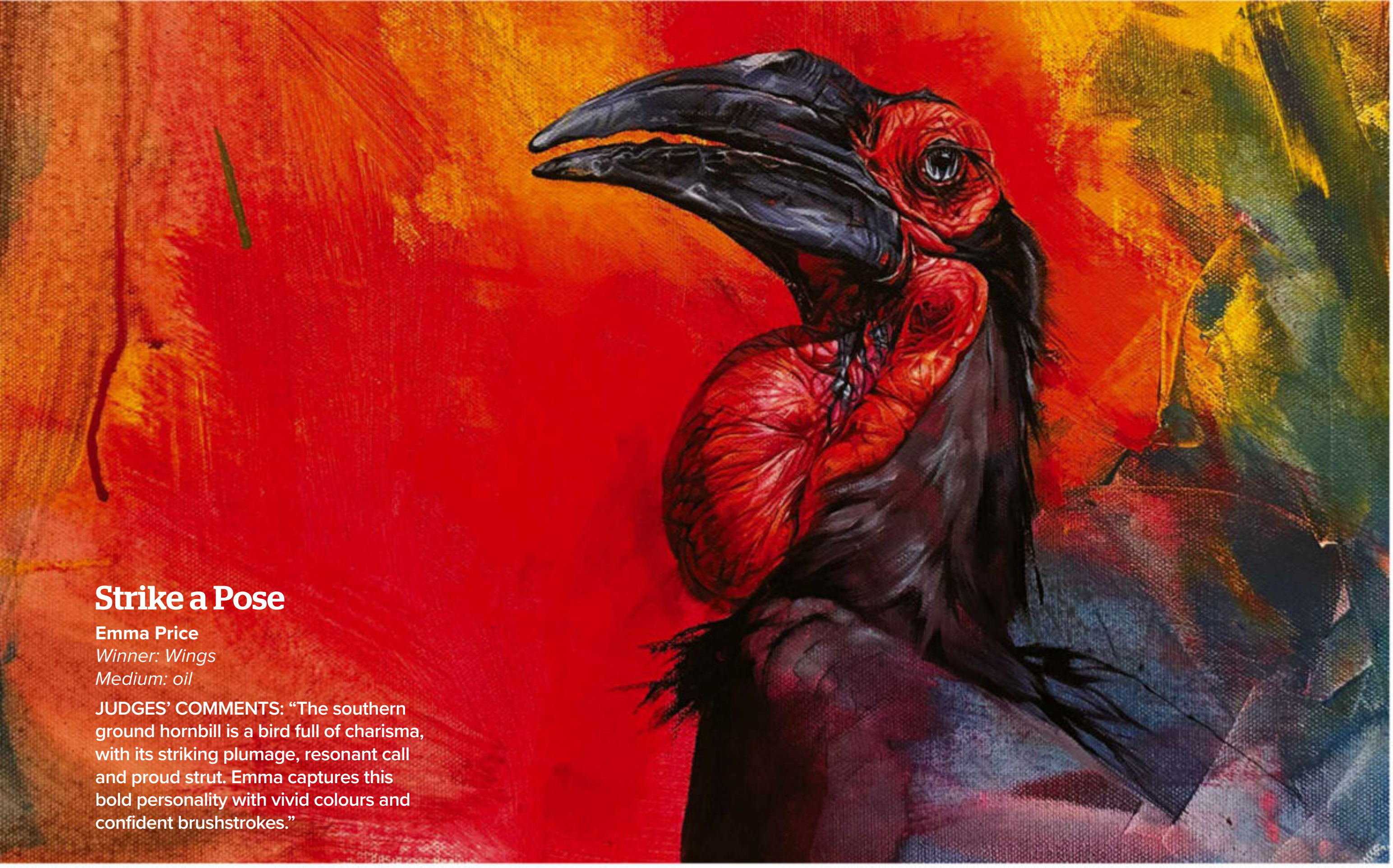
**Aniruddha Gupte**

*Winner: Michelle Lee Howk First Time Entrants Award*

*Medium: watercolour*

**JUDGES' COMMENTS:** "The black baza, a striking raptor from southern India, is both elusive and ecologically significant. In his delicate watercolour, Aniruddha celebrates the species, working with handmade paper and embracing the unpredictable qualities of the medium."





## Strike a Pose

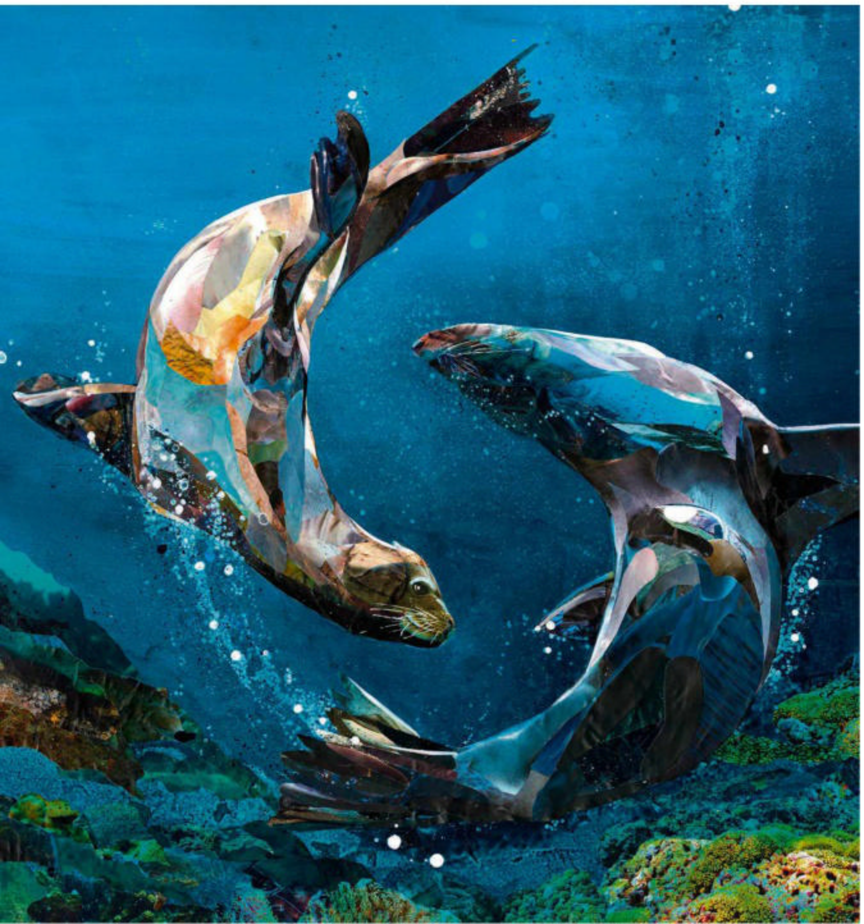
**Emma Price**
*Winner: Wings*
*Medium: oil*

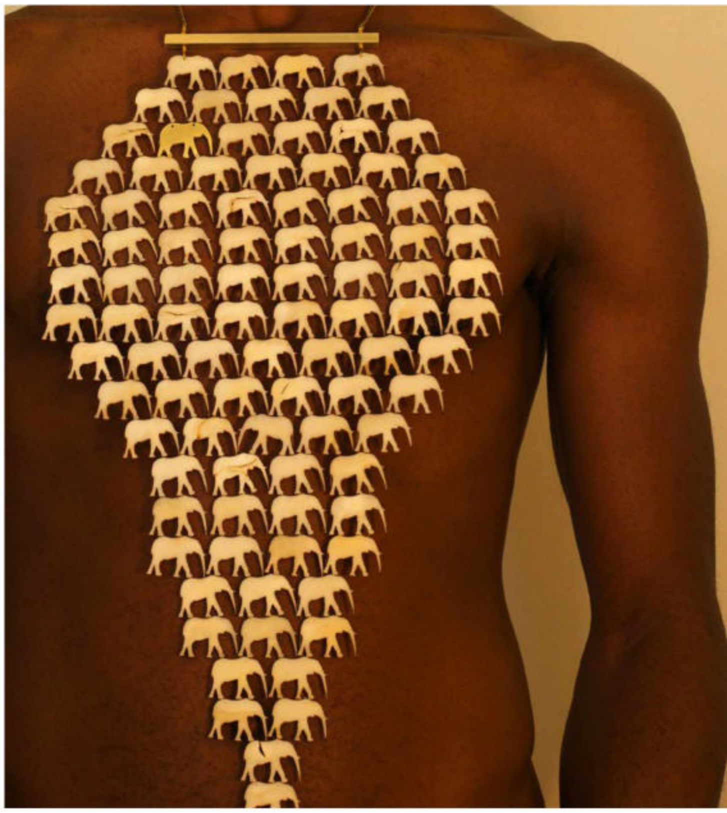
**JUDGES' COMMENTS:** "The southern ground hornbill is a bird full of charisma, with its striking plumage, resonant call and proud strut. Emma captures this bold personality with vivid colours and confident brushstrokes."

## First Dance

**Sarah Jackson**
*Winner: Into the Blue*
*Medium: recycled magazines*

**JUDGES' COMMENTS:** "This picture flows with the rhythm of the sea, celebrating the harmony of marine life. Sarah's innovative use of collage and ink mirrors the ocean's currents, transforming discarded material into textured, painterly compositions."

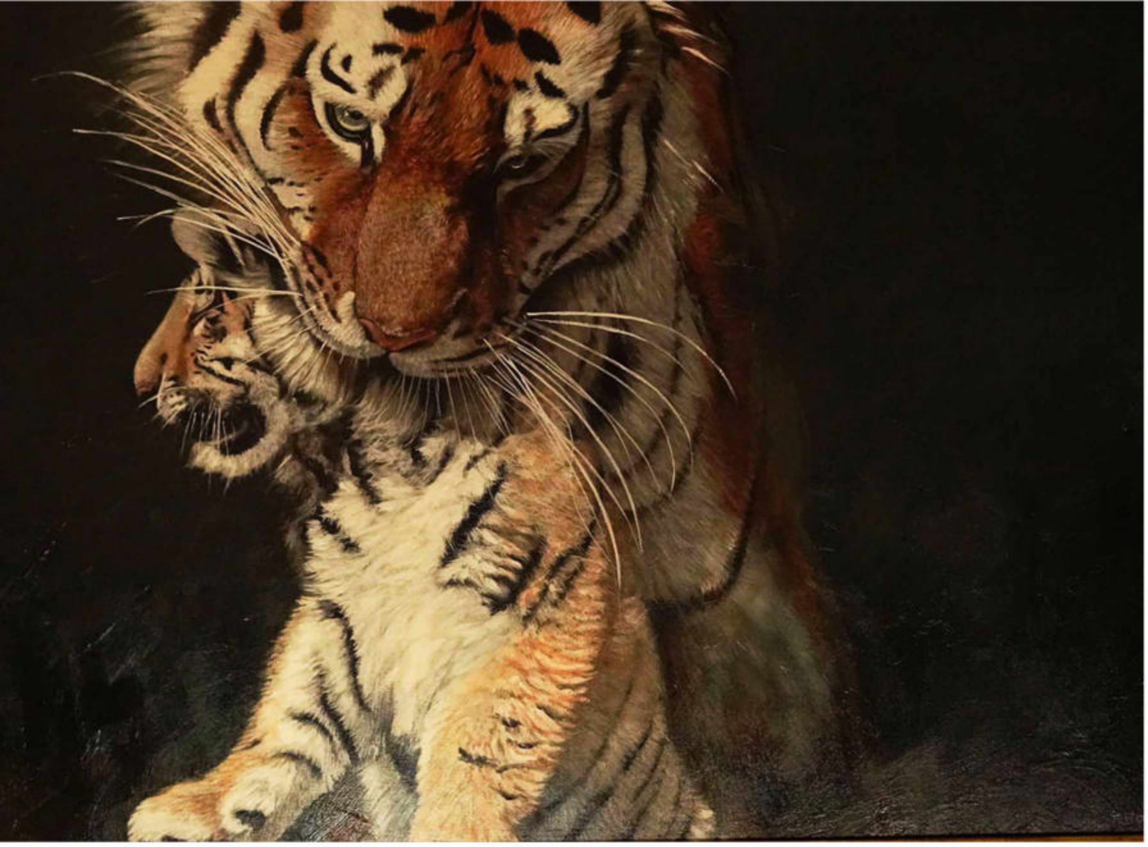




## The Daily Poaching Rate in Africa – 96 Elephants a Day

**Holly Budge**
*Winner: Facing Extinction*
*Medium: vegetable ivory*

**JUDGES' COMMENTS:** "Every day, some 96 elephants are killed for ivory in Africa, a statistic that Holly transforms into wearable art. One elephant faces the other direction to symbolise hope."



## Into the Light

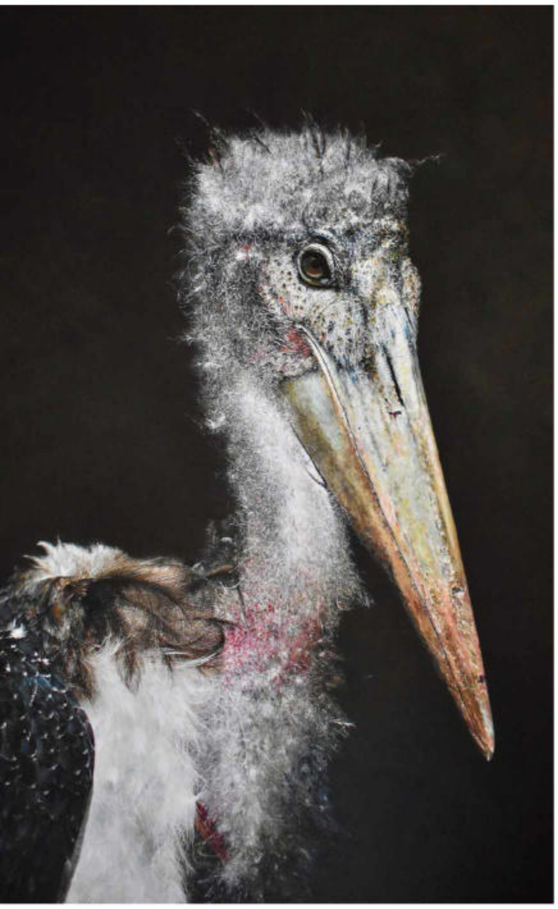
**Phillip Allder**
*Winner: Animal Behaviour*
*Medium: oil on canvas*

**JUDGES' COMMENTS:** "Few images are as powerful as a tiger carrying her cub. Phillip contrasts the ferocity of a top predator with the tenderness of motherhood, imbued with just a trace of threat."

## Iguazu Falls

**Hazel McNab**
*Winner: Earth's Wild Beauty*
*Medium: linocut*

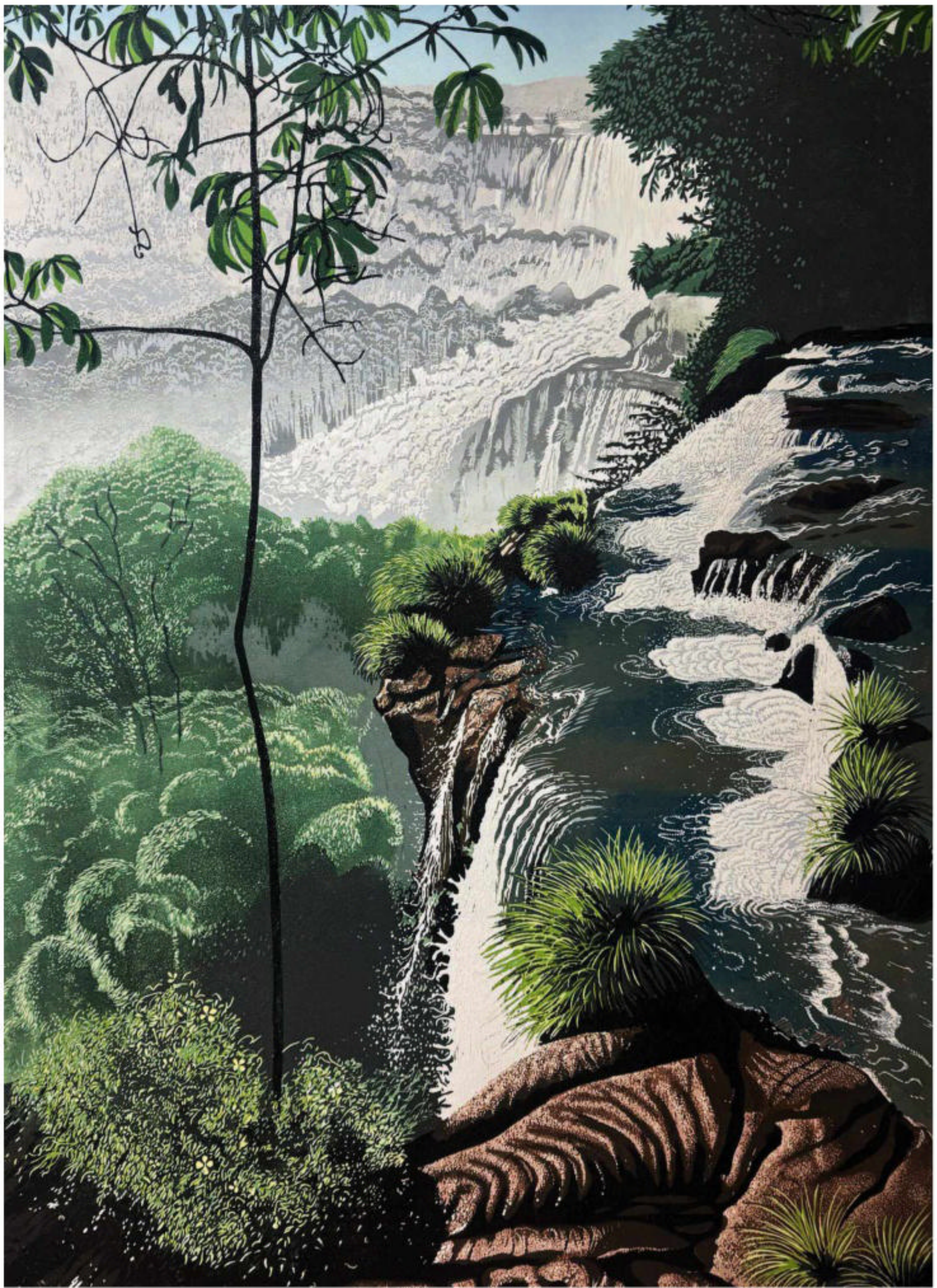
**JUDGES' COMMENTS:** "Hazel's reduction linocut captures the delicate balance between fragility and force, with a slender tree holding its own against a backdrop of roaring water. Hazel layers colour and texture with precision."

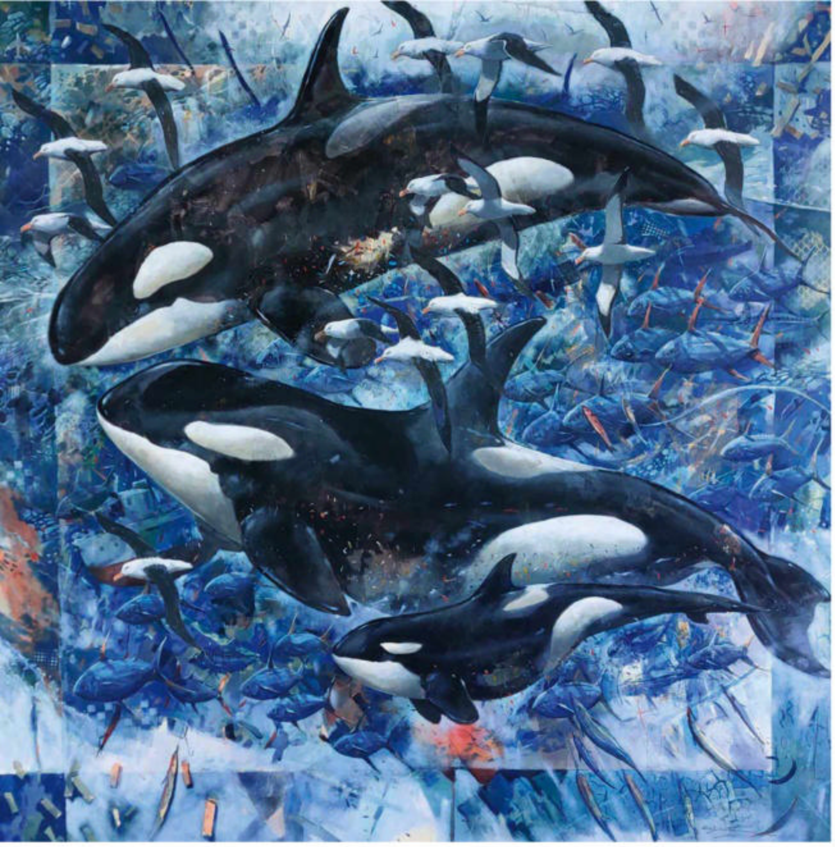


## The Undertaker

**Andrew Pledge**
*Winner: The Painters Online in Association with The Artist Award*
*Medium: oil*

**JUDGES' COMMENTS:** "Marabou storks may not fit traditional ideas of beauty, but Andrew challenges us to see them differently, and to find wonder in unexpected places."

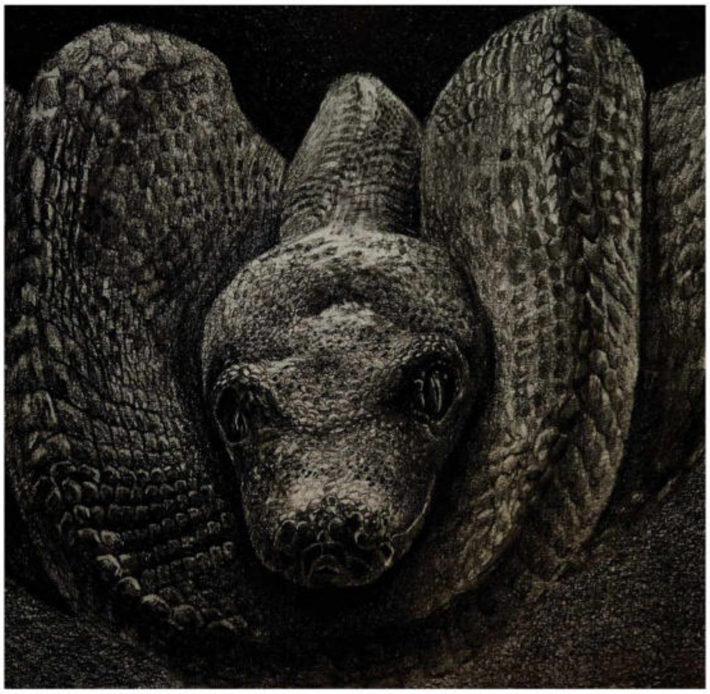




## In the Compass of the Oceans

**Derek Robertson**
*Winner: Environmental Artivism*
*Medium: mixed media*

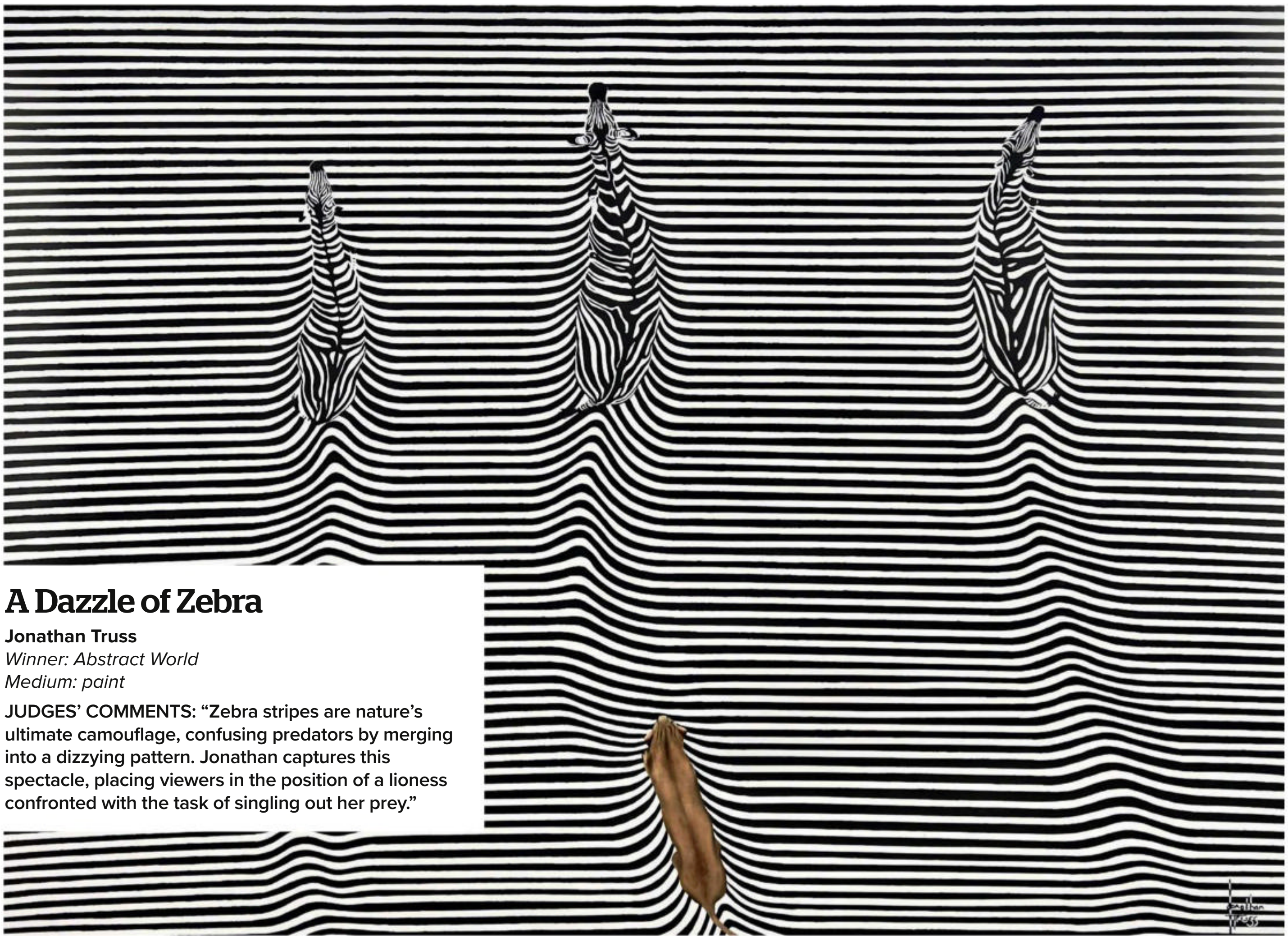
**JUDGES' COMMENTS:** "Orcas are majestic apex predators, but also indicators of ocean health. Derek's piece highlights their vulnerability to overfishing, climate change, pollution and plastic waste."



## How to Crawl While Stuck in the Darkness

**Sunghyun Chun**
*Winner: Youth Exclusive*
*Medium: pencil*

**JUDGES' COMMENTS:** "At just 17, Sunghyun Chun impressed the judges with his intricate pencil drawing of a snake emerging from the darkness."



## A Dazzle of Zebra

**Jonathan Truss**
*Winner: Abstract World*
*Medium: paint*

**JUDGES' COMMENTS:** "Zebra stripes are nature's ultimate camouflage, confusing predators by merging into a dizzying pattern. Jonathan captures this spectacle, placing viewers in the position of a lioness confronted with the task of singling out her prey."

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# Q&A

Email your questions to
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During the breeding season, Andean gulls move to lower habitats such as lakes

## Do all gulls live by the sea?

Most, but not all, species of gull live in coastal areas. There are in fact some mountaineers within the gull family. Ivory gulls sometimes breed on mountainous Arctic peaks, known as nunataks. These all-white gulls, perfectly camouflaged to Arctic life, build their nests on ledges and have been seen nesting as high as 1,800m (about the height of Mount Washington, USA, or nearly twice the height of Yr Wyddfa in Wales).

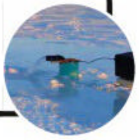
Andean gulls live in the Andes mountains of western South America, and can be found living as high as 4,500m (about the height of Mont Blanc in the Alps). They are well adapted to their arid, high-altitude living environment. For example, their eggs have fewer pores than eggs of their low-altitude relatives, thus avoiding excessive water loss.

Meanwhile, in the northern hemisphere, the brown-headed gull breeds on the plateaus of central Asia. This species can be found at 4,300m – that's about the height of Mount Rainier in the USA – and has specialised gut bacteria that help it to thrive at this height.

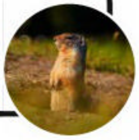
So, despite being known as seagulls, gulls are not just found at sea level: some species are serious mountain dwellers. **Beki Hooper**

ANDEAN GULL: OSCAR DEWHURST/NATUREPL.COM

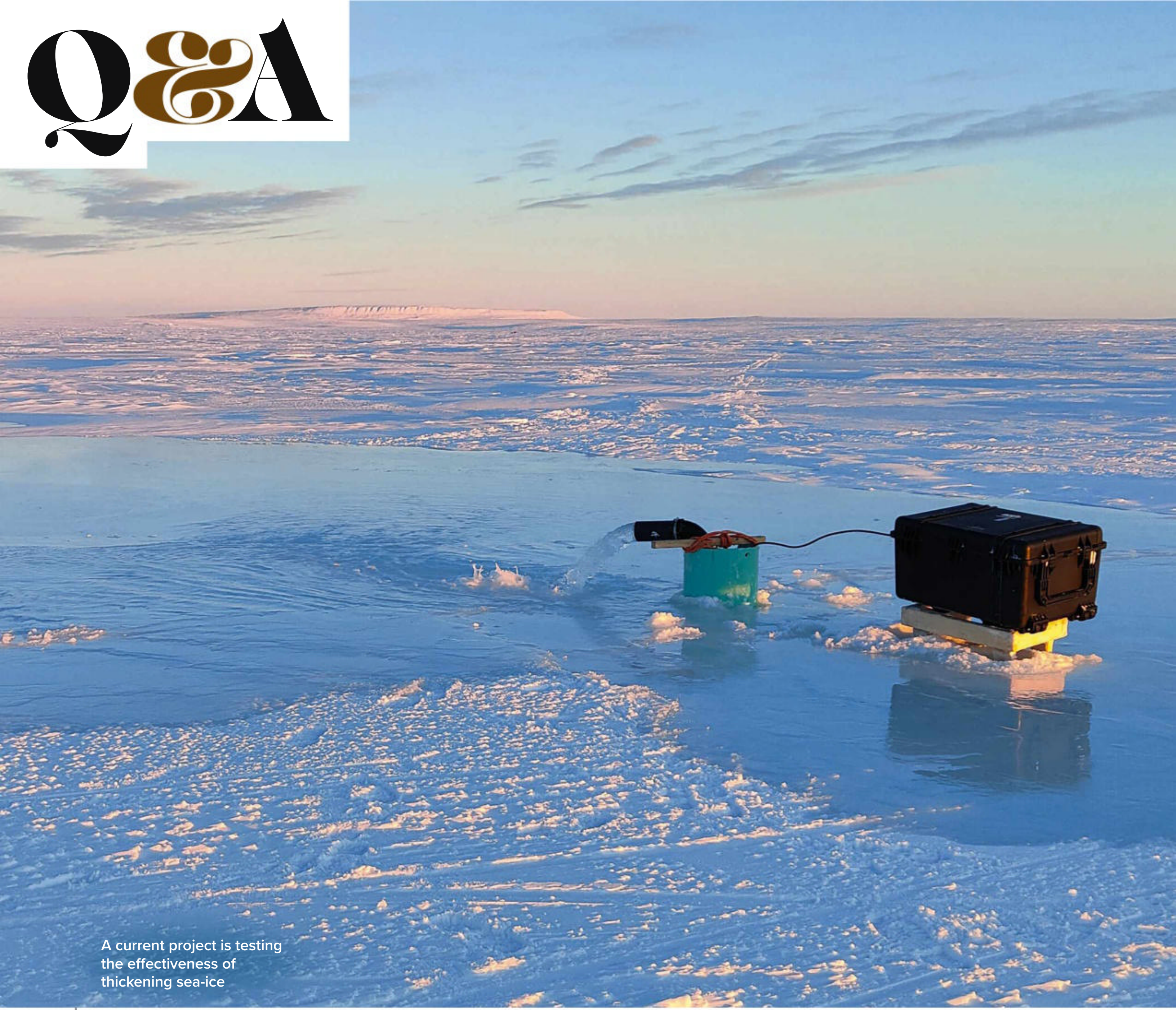
**COLD AS ICE**
Arctic ice is rapidly melting so is it possible to refreeze it? And should we even try? **p78**



**NOSY NEIGHBOURS**
Humans do it all the time but do we know whether other animals eavesdrop? **p82**



**MAGNIFICENT MARVEL**
This bizarre bird has a vocal mating display involving an inflating pouch **p84**



A current project is testing the effectiveness of thickening sea-ice

# Can we refreeze the Arctic?

THERE IS CONSIDERABLY LESS SEA-ICE in the Arctic than there used to be. Thanks to global warming, Arctic sea-ice is melting faster in the spring and taking longer to form in the autumn. Scientists who use satellite data to track Arctic sea-ice estimate that we've lost around 12 per cent of summer ice coverage for each decade since measuring began in 1985. And this trend is set to continue: the United Nations Intergovernmental Panel on Climate Change (IPCC) predicts that the Arctic is likely to be ice-free in summertime at least once by 2050.

> "This could give sea-ice formation a nudge"

Less ice means that less of the sun's energy is reflected back into space. Instead, it is absorbed by the dark surface of the Arctic Ocean, warming the water and leading to further melting. This will cause sea levels to rise dramatically, which will have devastating consequences.

Climate experts agree that we need to drastically reduce greenhouse gas emissions if we're to slow the rate at which Arctic sea-ice is melting and, ultimately, reverse the trend. But turning this ship around, even in the most optimistic of geopolitical contexts, won't be possible right away.

In the meantime, research is taking place into how we might use so-called geoengineering to give Arctic sea-ice formation a nudge in the right direction. Shaun Fitzgerald, director of the Centre for Climate Repair at the University of Cambridge, is leading a project exploring whether pumping sea water on to existing sea-ice in the Arctic might lead to the thickening of that ice. The hope is that thicker ice would take longer to melt in the summer. Recently awarded £9.9 million in public funding by the UK government's Advanced Research and Invention Agency (ARIA), the project involves mathematical modelling as well as laboratory and small-scale field experiments into the effects of flooding Arctic ice with sea water. This includes teaming up with the local Inuit community in Cambridge Bay, northern

Canada who, says Fitzgerald, "are greatly concerned about the ever decreasing amount of sea-ice. They are supporting the work to explore whether it might be possible to reduce the rate of loss." Fitzgerald hopes that at the end of the three-and-a-half-year project his team will have gathered sufficient data to help decide whether there should be more research into Arctic refreezing.

Other routes being explored to slow the rate of Arctic sea-ice melt include marine cloud brightening (MCB), where tiny particles of sea water are sprayed into clouds to make them better at reflecting solar energy back into space. This research draws on field experiments that have been using MCB to protect the Great Barrier Reef from heat stress. Another sky-based research area involves injecting aerosol compounds high up in the stratosphere – the second-lowest layer of the atmosphere, above where clouds form. It is thought they could reflect some solar energy back into space, thereby cooling the surface of the Arctic and slowing the melting of sea-ice. This technology replicates the natural cooling effect of reflective particles that enter the stratosphere following volcanic eruptions. As with the other methods, this research is at an early stage, assessing whether it would be feasible and safe to release natural mineral dust into the atmosphere. Geoengineering isn't without criticism, however. A study published in *Frontiers in Science* in September reviewed five geoengineering concepts and deemed them unfeasible and expensive, suggesting decarbonisation as an alternative to intervening in fragile polar ecosystems. Whatever the outcome of the studies, we won't be refreezing the Arctic any time soon. **Jo Caird**

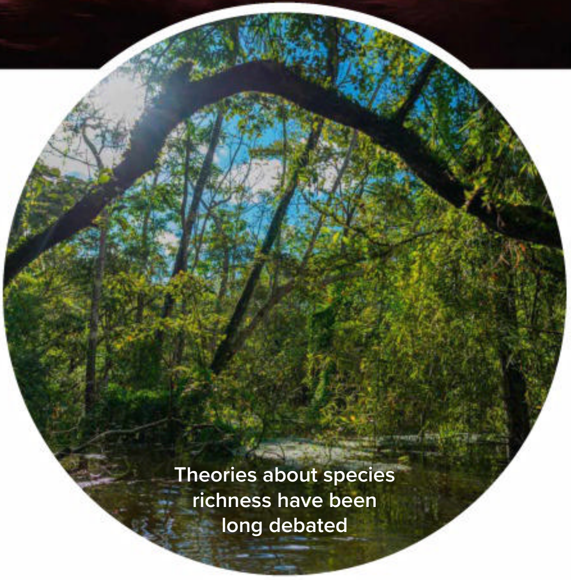
"Geo-engineering isn't without criticism"

Polar bears rely on ice sheets for hunting, breeding, travelling and denning

Researchers work on a pump as part of a project investigating whether it's possible to thicken Arctic ice

PUMPING WATER: REAL ICE; WORKING ON THE PUMP: ELISE IMBEAU; POLAR BEARS: ANDY ROUSE/NATUREPL.COM

Brazil's Mamirauá Reserve is home to more than 400 bird species



Theories about species richness have been long debated

# Why are the tropics so diverse?

AS YOU MOVE FROM THE POLES towards the equator, species richness increases. It's a pattern that's been termed the 'latitudinal biodiversity gradient' by ecologists, and Victorian naturalist Alfred Russel Wallace was a pioneer in recognising and attempting to explain it.

Wallace attributed this abundance to time: specifically that land closer to the equator was the earliest formed and hadn't been disturbed by glacial activity at higher latitudes. He theorised that the relative stability of the tropical climate through the year, and through the ages, allowed species to accumulate here.

"Catastrophic mortality could affect biodiversity"

Almost 150 years later, understanding patterns of species richness is critical given today's global biodiversity crisis, and theories are hotly debated. One avenue of research claims the larger amount of solar energy at the equator is responsible for increased productivity, meaning a greater abundance of resources and more opportunity to adapt and specialise.

Another argues that the lack of 'catastrophic mortality' from climate events (particularly winter freezes) means species focus on competition for resources, resulting in faster evolutionary responses. Other experts contest that the increased number of predators at low latitudes drives the diversity of prey species.

While Wallace reasoned that "uniformity and permanence" were the essential drivers for biodiversity, recent research suggests change in the environment could be a key component.

Researchers from the University of St Andrews, Scotland, monitored fish populations on an Amazonian floodplain in surveys spanning almost 20 years. The research took place in the Mamirauá Reserve, which extends over more than a million hectares, and is the largest area of flooded forest in Brazil. During the high-water season, the forest can be flooded to a depth of up to 12m, with fish swimming between the branches of inundated trees. In the study, even the supremely adaptable red-bellied piranha and Amazon cichlid were unable to dominate in this fluctuating ecosystem, enabling more species (including rare ones) to coexist. The scientists concluded that this natural environmental change could therefore fuel biodiversity, as no one species was found to predictably exploit the largest fraction of local resources.

However, in the year following the final survey, the dry season exceeded all previous records. Researchers found that in higher water temperatures and lower water levels, omnivorous and bottom-feeding fish species flourished while others declined. How a changing climate may alter the tropics' biodiversity is yet to be seen. **Ella Davies**

MAMIRAUÁ RESERVE: CAVAN IMAGES/ALAMY; BRAZILIAN RAINFOREST: WOLFGANG DIEDERICH/ALAMY

# Do other animals have milk teeth?

As diphyodonts, humans have two sets of teeth: our milk (or deciduous) teeth, and our permanent teeth. One of the main reasons we have two sets of teeth is because we eat solids long before our jaws are fully grown. If our permanent teeth erupted when we started eating solids, they'd have to be very small and we'd therefore have lots of empty space in our mouths as we grew up.

Most mammals are diphyodonts just like us, but there are exceptions. Dolphins, for example, have one set of teeth to last their whole life. Their teeth erupt at around three months of age, and they grow in layers, just like trees. Seals have milk teeth, but they often shed them in the womb and so are born with only permanent teeth.

Meanwhile, elephants have 'conveyor belt' teeth, with newly grown 'marching molars' moving forward from the back and pushing out older teeth. Elephants do begin life with milk teeth, though – and 'milk tusks', called tushes.

No non-mammalian species are diphyodonts. Most replace their teeth throughout their lives, and are therefore polyphyodonts. **Beki Hooper**

An elephant usually has 26 teeth, including its tusks

Dolphins have one set of teeth to last their entire lifetime

AFRICAN ELEPHANTS: KLEIN & HUBERT/NATUREPL.COM; BOTTLENOSE DOLPHIN: BRANDON COLE/NATUREPL.COM

Prairie dogs are known for their loud alarm calls to the rest of their group

PRAIRIE DOG: KATERYNA KUKOTA/ALAMY

# Do any animals eavesdrop?

We might think of eavesdropping as a uniquely human trait, but it isn't. In fact, eavesdropping is an important survival technique for many species. By listening in on what other species are communicating to one another, valuable information can be learned.

On the grasslands of North America, for example, black-tailed prairie dogs make alarm calls when they spot predators. The reason they call is to warn other prairie dogs of danger, so that they can take cover and therefore escape being eaten. But it's not only other prairie dogs who listen out for these alarm calls. Recently, researchers discovered that long-billed curlew pay attention to prairie dog calls too.

The researchers set up an experiment where a predator (in this case, a stuffed badger) moved towards incubating curlews. In half the cases, the researchers played prairie dog alarm calls while the predator moved toward the curlews, while in the other half no sounds were made. Incubating curlews adopted a nest defence posture more quickly when prairie dog alarm calls were made than when they were not. This suggests that curlews both listen to prairie dog's alarm calls, and act on this information by engaging in faster nest defence.

> "Valuable information can be learned by listening in"

This is a classic example of eavesdropping: the prairie dogs are only trying to communicate to their own kind, but the information is useful for curlews, and they therefore listen out for it and use it for their own (and their offspring's) survival advantage.

Burrowing owls are known to do the same: they listen for prairie dog alarms and become more alert when they hear a prairie dog shout about danger.

Interestingly, many species seem to like living near prairie dog 'towns', even though there tend to be more predators in these areas. Researchers think this might be because of the perks of having such noisy neighbours. By telling one another about predators, prairie dogs inadvertently protect far more than they bargain for.

Such loud information sharers are known as keystone information producers. Other keystone information producers include chickadees and titmice, both North American bird species. The loud alarm calls of chickadees and titmice not only give other species an early warning of danger, therefore decreasing predation risk, but their calls also mean that eavesdropping species can spend less time scanning for danger and more time eating – good news all round. **Beki Hooper**

# Which animal has the best sense of hearing?

One that has no obvious ears! The greater wax moth, which lays its eggs in honeybee hives around the globe, is said to have the best hearing of any animal on Earth. This little, silvery grey moth hears using a pair of simple devices called tympanal organs. These are not ears as most people think of them, with fur and skin and flappy bits of cartilage. Instead, they are thin membranes stretched across air-filled chambers, located on either side of the moth's thorax.

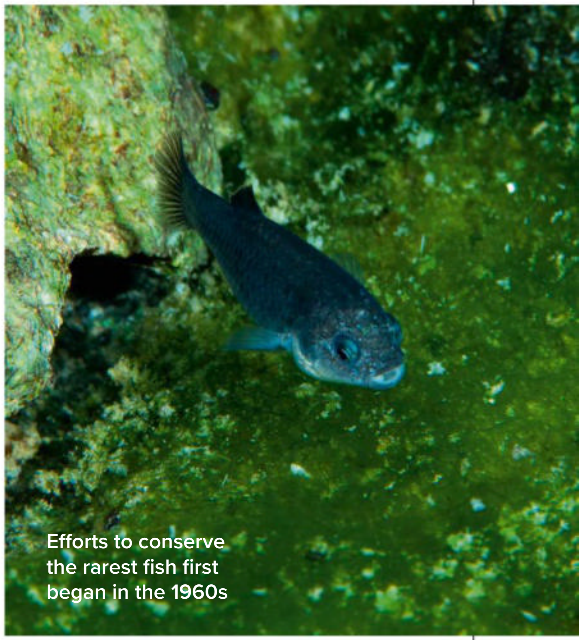
The membranes vibrate in response to sound, sending signals along the auditory nerve to the brain where they are processed. Laboratory studies, which have recorded electrical activity from the auditory nerve, have shown that the moth can detect frequencies of up to 300kHz. For context, humans can hear up to 20kHz, dolphins up to 150kHz and bats up to around 210kHz.

The moth's impressive hearing range is thought to have evolved in response to pressure from its winged, fly-by-night predators: bats. Over time, the moths developed the ability to detect the high-frequency calls that bats make as they echolocate their prey. Their excellent hearing helps to prevent them from being eaten. **Helen Pilcher**

Greater wax moths produce ultrasonic sound for mating

A bat's long ears aid its sensitive hearing

# What's the rarest fish?


Efforts to conserve the rarest fish first began in the 1960s

The entire population of the Devils Hole pupfish lives in one cave in Death Valley, Nevada, USA. The cave (Devils Hole) is about 22m long and 3.5m wide. While it is deep – at nearly 150m – the fish tend to live within 15m of the surface. This means the Devils Hole pupfish probably has the smallest habitat range of any vertebrate.

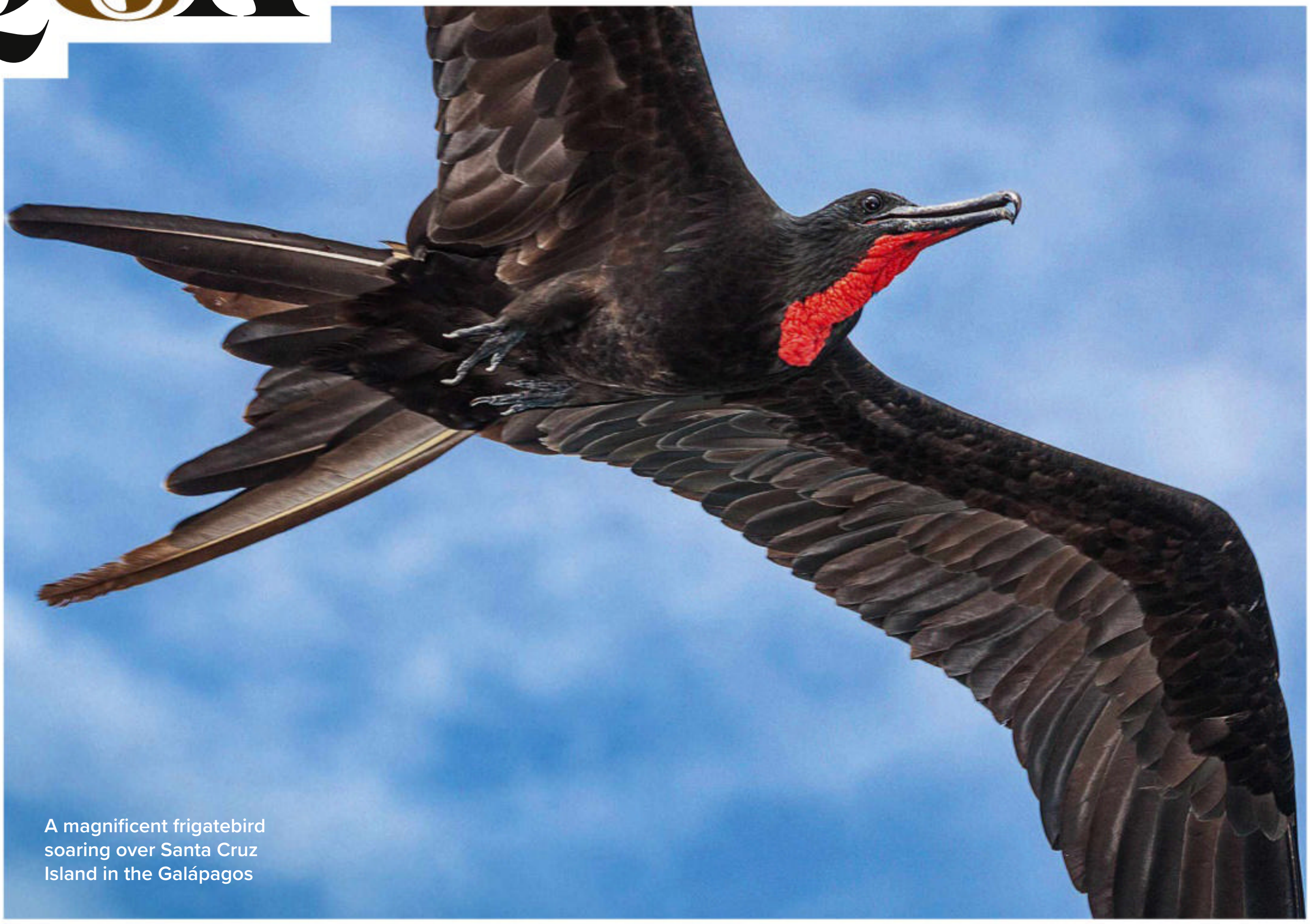
They are also the rarest fish. While 191 fish were counted in 2024, only 38 fish were found in 2025. Two earthquakes are thought to be the cause of the sudden population decline. The quakes disturbed algae (the fish's main food) and the fish's eggs.

Thankfully, biologists had an action plan in place for just such an event. They have supplemented the wild population with captive-bred individuals and will provide food until the algae regrow.

Some studies suggest the Devils Hole pupfish has been isolated since the cavern's formation 60,000 years ago, while others suggest they have only been isolated for a few thousand years.

Nobody knows exactly how they first appeared – theories range from the fish arriving via underground water systems to birds accidentally transporting them to the cavern. But it's safe to say there's a lot we still don't know about this enigmatic species. **Beki Hooper**

NORTHERN LONG-EARED BAT: BRUCE THOMSON/NATUREPL.COM; GREATER WAX MOTH: FLPA/ALAMY; DEVILS HOLE PUPFISH: BIOSTOCK IMAGES/ALAMY



A magnificent frigatebird soaring over Santa Cruz Island in the Galápagos

### ALL YOU EVER NEEDED TO KNOW ABOUT THE

# Magnificent frigatebird

BY RICHARD PALLARDY

ONE MIGHT BE FORGIVEN FOR thinking that pterodactyls had been de-extincted upon first sighting the silhouette of a magnificent frigatebird. Boasting a wingspan of more than 2m, the bird cuts an imposing figure as it cruises coastal America looking for prey. While humans have nothing to fear, other seabirds would be well-advised to keep an eye peeled – frigatebirds are notorious thieves and won't hesitate to steal a catch rather than do the work.

### What do they look like?

Adult magnificent frigatebirds are a glossy jet black. Their wings are long and angular and their tails are forked, though the fork may sometimes be closed in flight. The males are slicked with purple iridescence on their shoulders and sport bright red gular pouches on their throats, which they inflate as part of their breeding displays. They have black or grey feet. Females have white breasts and shoulders, and pink feet. Juveniles are brown with white heads and breasts. The bird's long beak is hooked at the tip to assist with gripping prey. Despite their apparent size in the air, they weigh just 1-1.4kg at maturity.

### Where do magnificent frigatebirds live?

They patrol the coastal regions of North and South America, ranging from California to Ecuador in the Pacific and Florida to Brazil in the Atlantic. Vagrants are occasionally recorded as far inland as the Midwest following severe storms.

### Are their flight patterns unique?

Magnificent frigatebirds are masters of the air. With the largest ratio of wing surface to bodyweight of any bird species, they are capable of gliding for up to 65km without flapping. They can climb to heights of more than 3,500m, summiting massive cumulonimbus clouds. They can even sleep in the air – half of their brains will take 10-second naps, avoiding fatigue as they remain aloft for up to two months at a time.

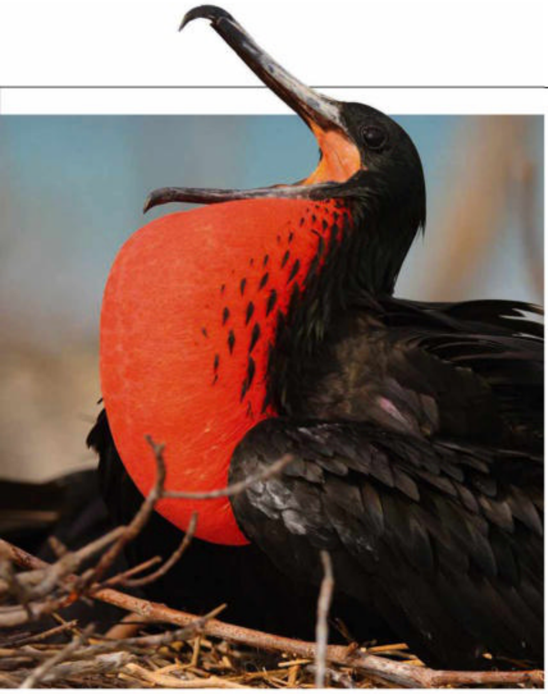
### What do these birds eat?

They eat mainly fish, squid and crustaceans, and though they scoop prey from the sea, they never land on the water, as their uropygial glands do not secrete sufficient oil to waterproof their feathers.

While they are adept predators, targeting animals driven to the surface by dolphins and large fish, frigatebirds will not hesitate to scavenge, even following ships in search of scraps. These 'marine vultures', as John James Audubon called them, also pilfer fish from other seabirds, taking the quarry from their beaks or shaking the other bird by the tail and devouring the fish it then vomits. They eat the unattended young of boobies, petrels and terns, too.

### How do magnificent frigatebirds breed?

Large groups of males court females by inflating the scarlet gular sacs on their necks,



Frigatebird prey is driven to the surface by an Atlantic sailfish

Top: In a mating display it can take up to 20 minutes for the male to inflate his gular pouch. Above: A female settles in with her chick for a lengthy parenting season

like balloons. They then throw their heads back and flap their wings while emitting drumming sounds and shrill squawks.

Once paired off for the season, the females build nests of sticks fetched by the males in low trees or on the ground, and lay a single egg. The pair incubates it for around 50 days and when it hatches, take turns watching their offspring for the first three weeks. Frigatebirds may cannibalise the young of other pairs in the colony, so vigilance is paramount.

The male continues to provide help with feeding for around three months before leaving the female and nestling on their own. While the youngster fledges at around five months, the female continues to care for it for another seven months – the longest parental care recorded in any bird species. Because of this extended period of responsibility, females only breed once every two years.

### Do they live long lives?

Magnificent frigatebirds can live well into their 30s and some may reach 40 years old. They do not reach sexual maturity until they are eight to 10 years old. Females breed at earlier ages than males.

### How many species are there?

There are four additional species of frigatebird. The lesser frigatebird (*Fregata ariel*) and great frigatebird (*Fregata minor*) are native to the Indian and Pacific Oceans. The Ascension frigatebird (*Fregata aquila*) is native only to the Atlantic island of Ascension. And the Christmas frigatebird (*Fregata andrewsi*) is only found on Christmas Island in the Indian Ocean.

### What birds are they related to?

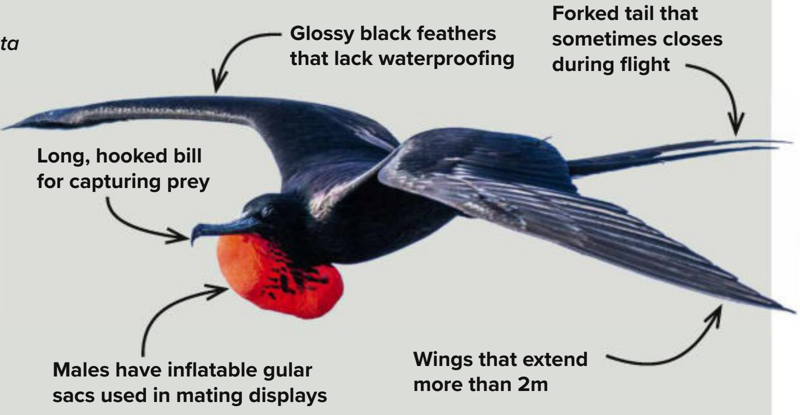
Frigatebirds have been traditionally classified with the Pelecaniformes, a larger group of birds including pelicans. However, some taxonomists now place them in the narrower Suliformes taxon with cormorants, boobies, gannets and anhingas.

### Are magnificent frigatebirds threatened?

The IUCN lists the species as Least Concern. Nonetheless, commercial fishing likely affects the species both by targeting its prey directly and harming the larger species that drive prey to the surface where the frigatebirds can capture it. An isolated population once found in the Cabo Verde islands has been extirpated, probably due to a combination of human exploitation and inbreeding resulting from the shrinking size of the population. Ⓦ

### ➔ A MAGNIFICENT FRIGATEBIRD'S SPECIAL FEATURES

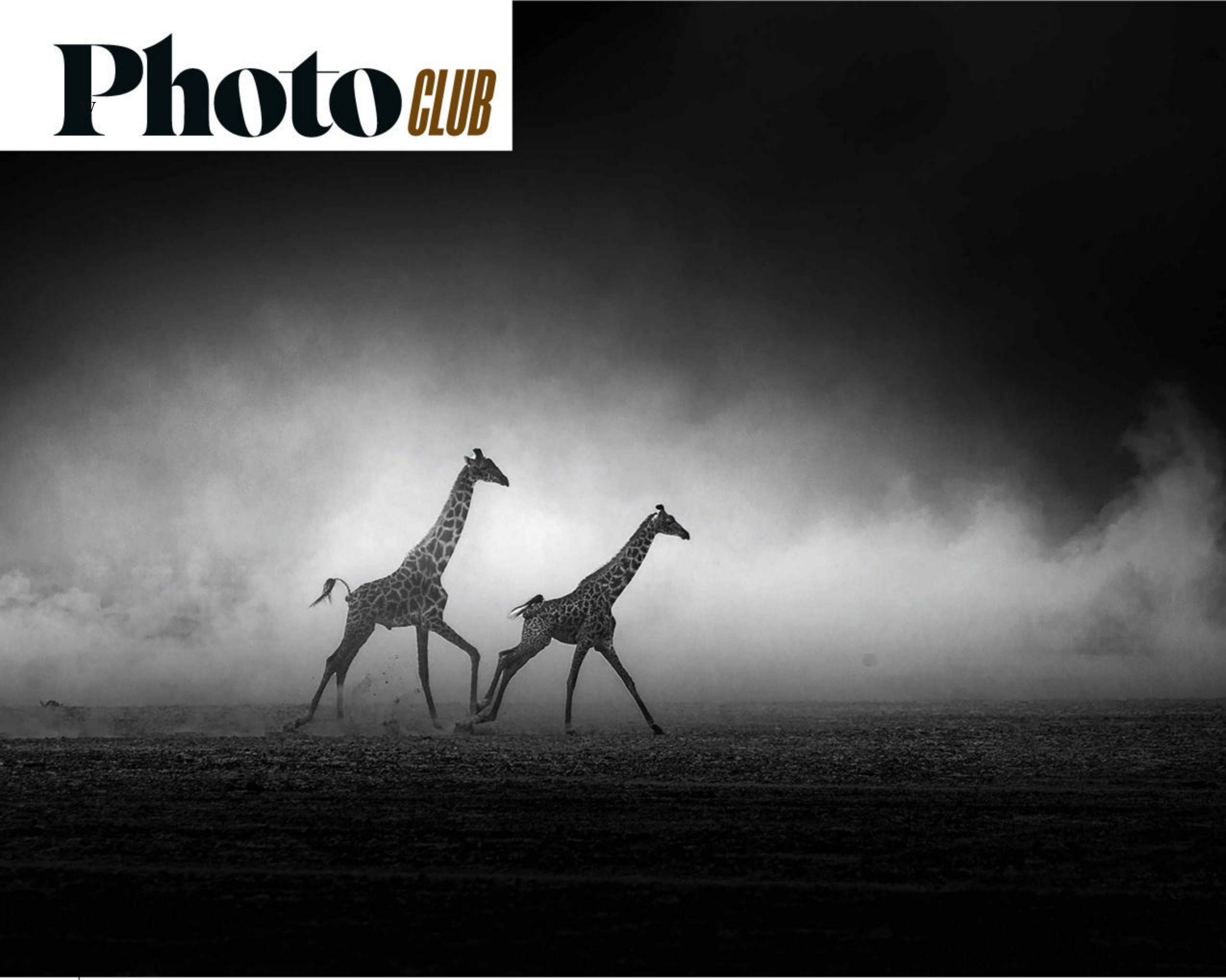
**Scientific name:** *Fregata magnificens*
**Family:** Fregatidae
**Weight:** 1.5kg
**Speed:** 153kmph
**Lifespan:** 30-40 years


Glossy black feathers that lack waterproofing
Forked tail that sometimes closes during flight
Long, hooked bill for capturing prey
Males have inflatable gular sacs used in mating displays
Wings that extend more than 2m

## NEXT MONTH

**FENNEC FOX**
The tiny desert-dwelling canid

MAGNIFICENT FRIGATEBIRD: DAVID FLEETHAM/NATUREPL.COM; DISPLAYING FRIGATEBIRD: GERRIT VYN/NATUREPL.COM; FRIGATEBIRD AND CHICK: CLAUDIO CONTRERAS/NATUREPL.COM; ATLANTIC SAILFISH AND FRIGATEBIRDS: TIM FITZHARRIS/NATUREPL.COM; SPECIAL FEATURES: TOM VIERUS/NATUREPL.COM; FENNEC FOX: BRUNO D'AMICIS/NATUREPL.COM

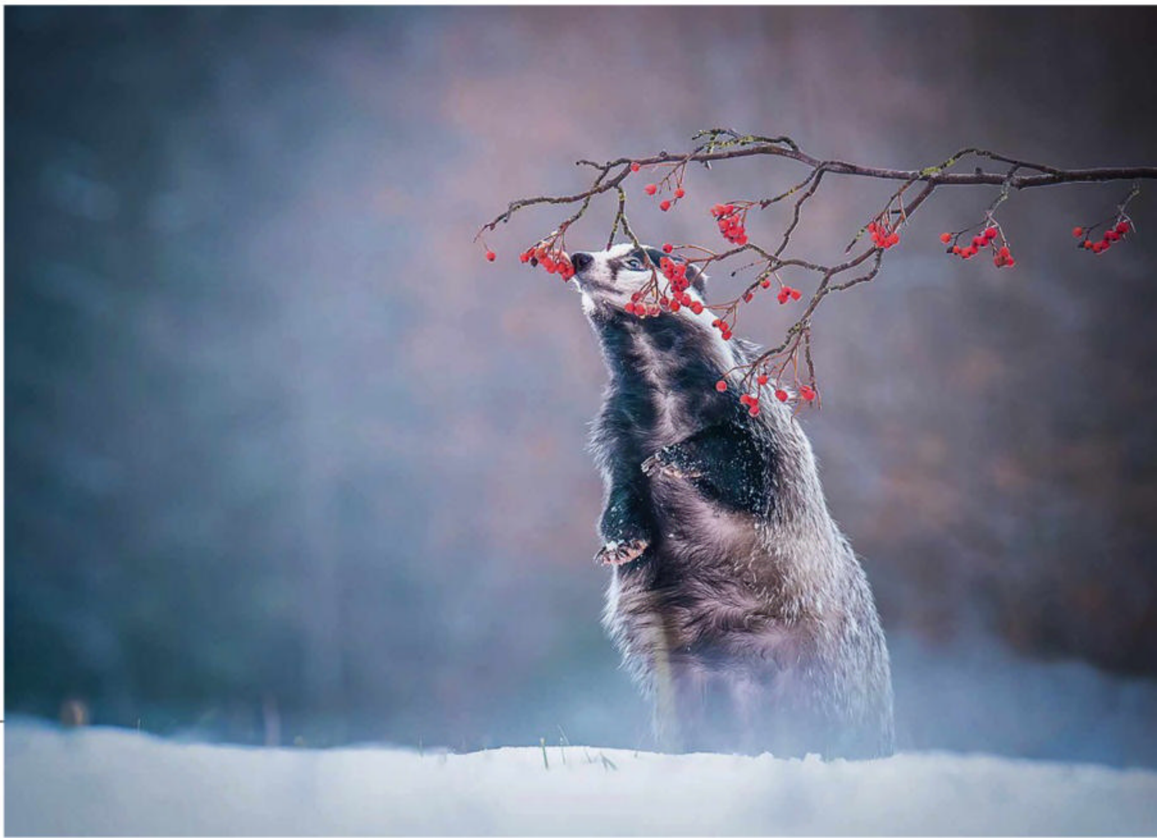


## Into the dust

**We were in Amboseli National Park in Kenya, watching these giraffes drinking at a water hole, when they suddenly started to run. Converting the image to black and white heightens the drama of the dust in the harsh morning light.**
*Remya Warrier, India*

## Forest fruits

**There's always something interesting happening with animals in local forests. This badger foraging in the snow is a wonderful example.**
*Zdeněk Filák, Frýdek-Místek, Czech Republic*



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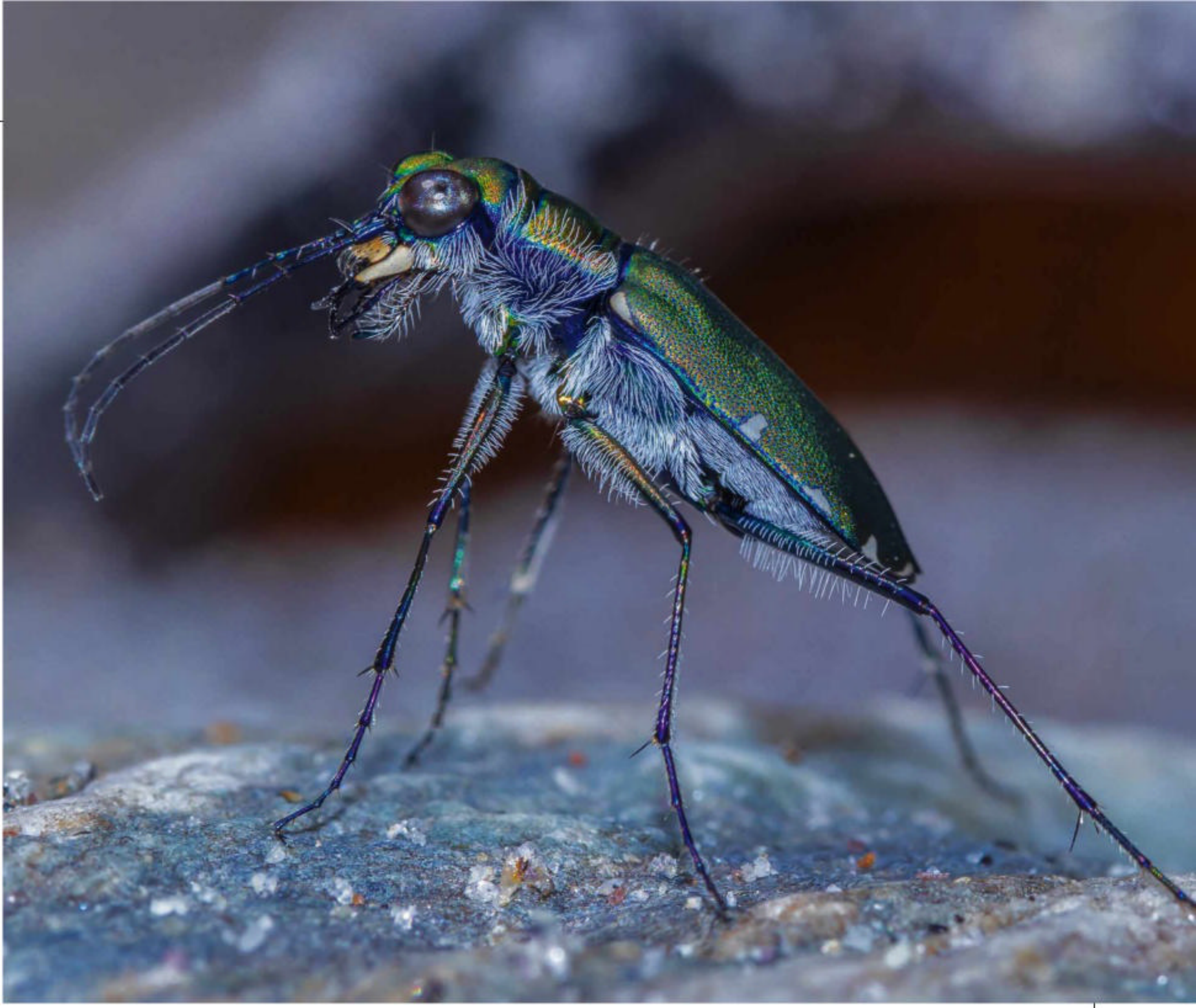
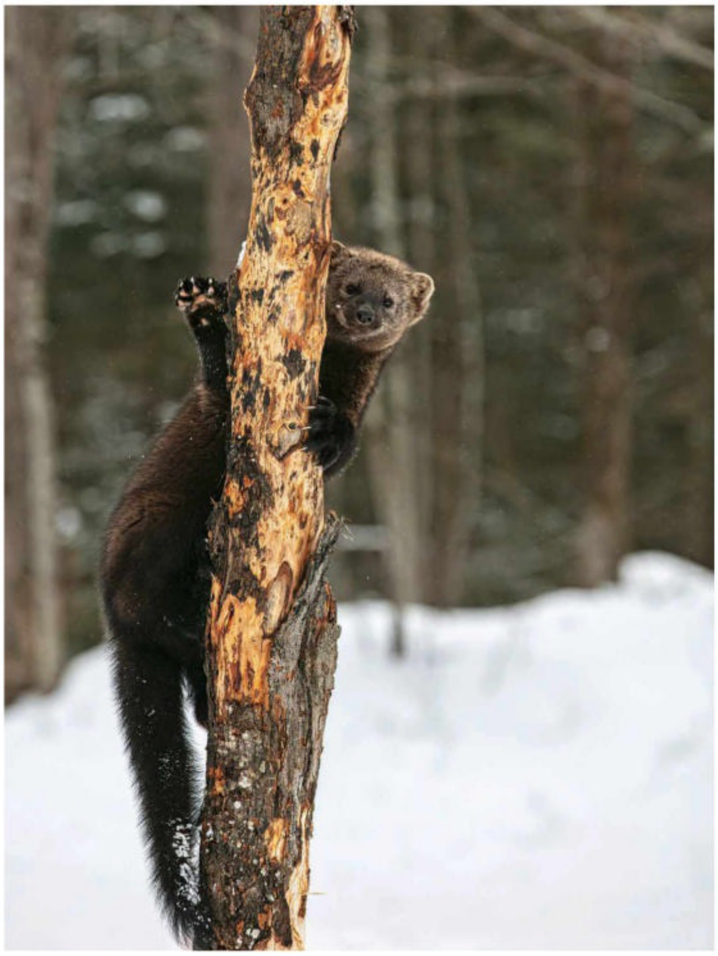
### Bright eyes

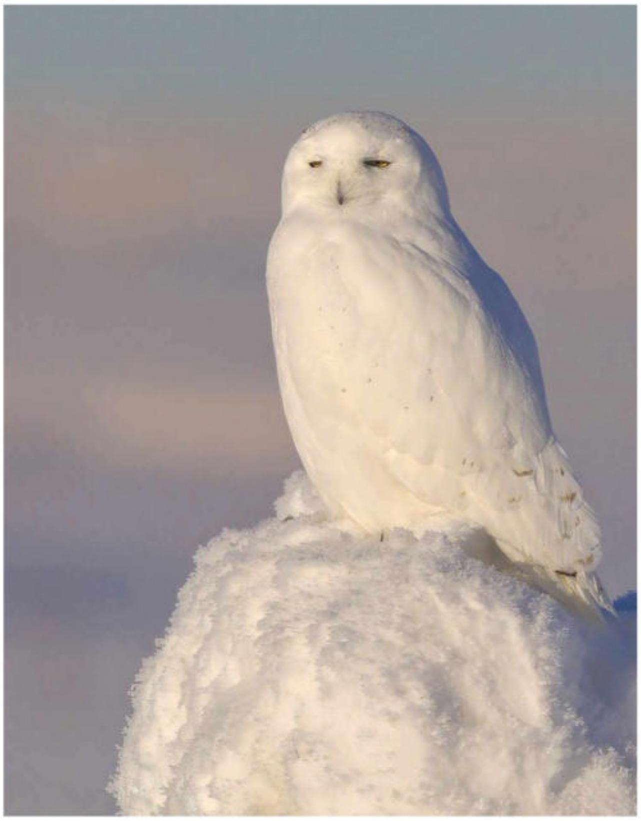
While looking for butterflies by the Rangit River in Sikkim, I was distracted by the tiger beetles and got this shot.
*Souvick Mukherjee, West Bengal, India*



### Gone fishing

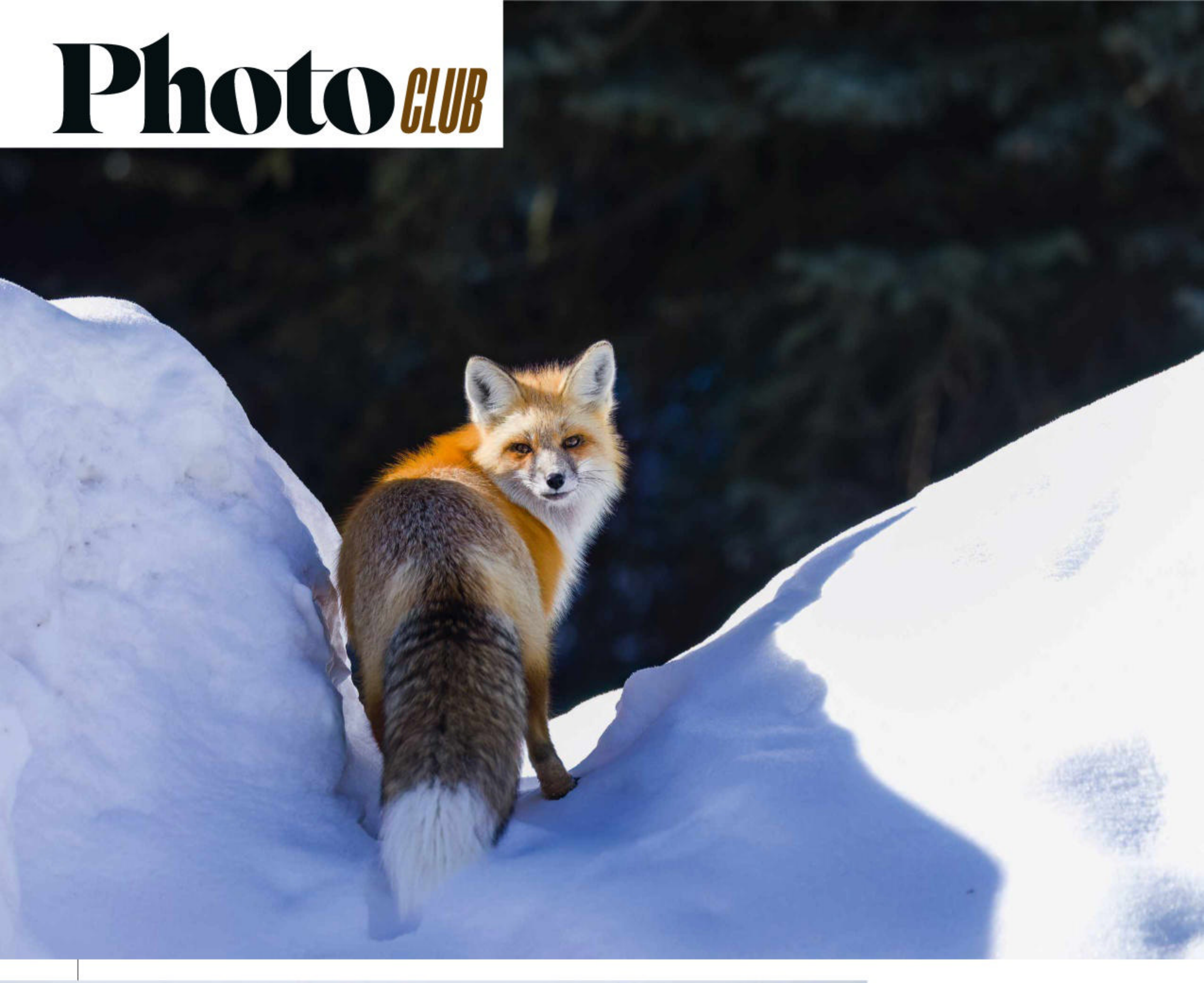
Living in the Algonquin Highlands is a wildlife gift. I was at my desk when this fisher appeared outside – the population has grown considerably over the past few years.
*Tammy Nash, Ontario, Canada*

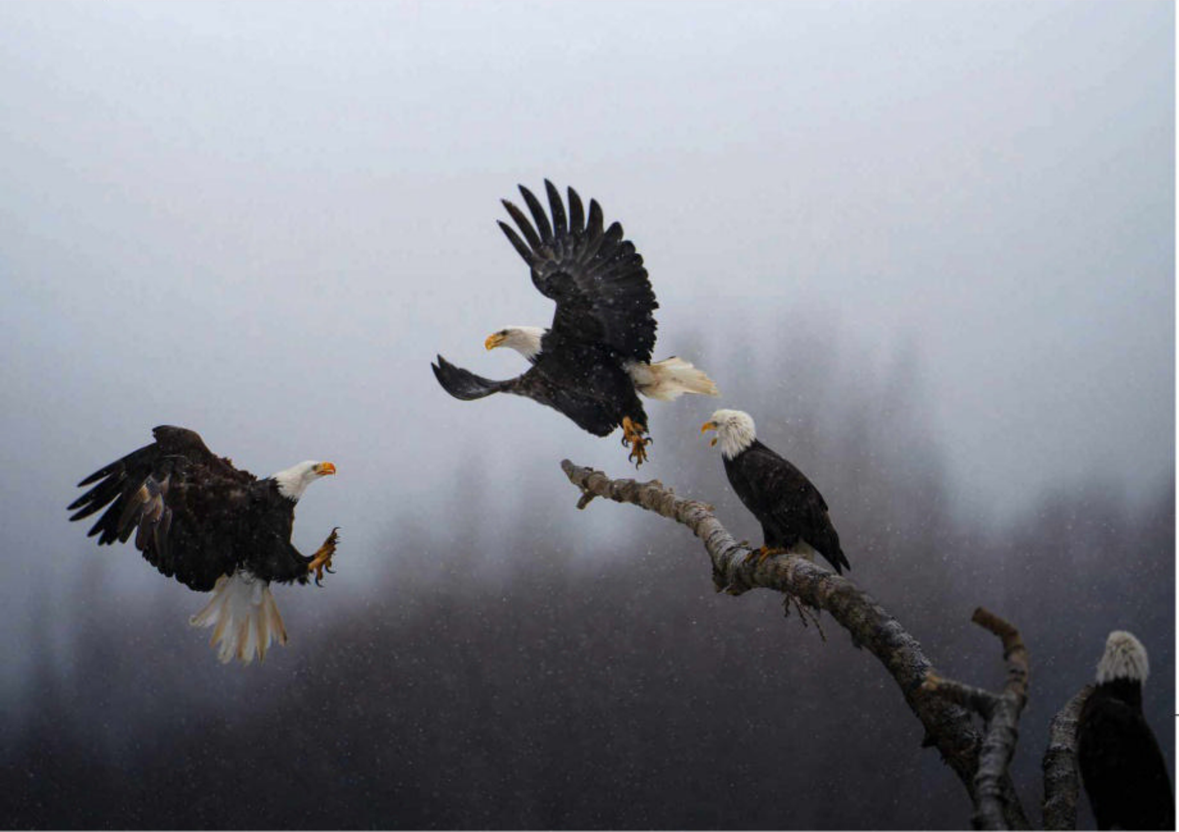




### White magic

This beauty is one of many migrating snowy owls that arrive from the far north to spend winter in the grasslands just east of Calgary.
*Jennil Modar, Alberta, Canada*





## Playful poser

**We followed the gaze of a group of photographers watching something in Yellowstone National Park and saw this red fox. Its red coat in the glistening snow was a marvellous sight that morning.**
*Christopher Johnson, Stevensville, Montana, USA*

## Action stations

**In November, hundreds of bald eagles gather at Alaska's Chilkat Bald Eagle Preserve to feast on salmon. By studying their behaviour I was able to anticipate their actions and shoot at this hangout spot.**
*Karthik Subramaniam, San Francisco, USA*

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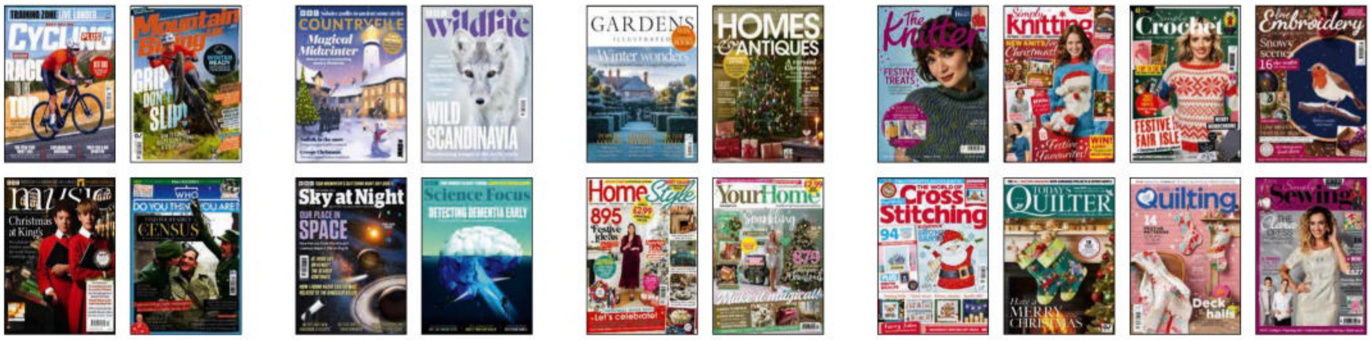

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Spending days in streams for stunning shots

# SNAP-CHAT

THE INSIDE WORLD OF WILDLIFE PHOTOGRAPHY

## Isaac Szabo talks hellbenders, chub nests and bears on the roof

**How did your career start?**

I had a tropical aquarium as a young adult, and began to wonder what kind of fish might be living in my local streams. I decided to find out by sampling streams with a dip net and soon became captivated by the diversity of form, colour and behaviour of freshwater life. Snorkelling with and photographing fish in the wild was much more fun than keeping them in aquariums.

**Why focus on the freshwater world?**

It's a world that is rarely seen. While the beauty of coral reefs is widely recognised, many people are unaware of the fascinating activity that happens in a freshwater stream.

**What's been your most memorable wildlife shoot?**

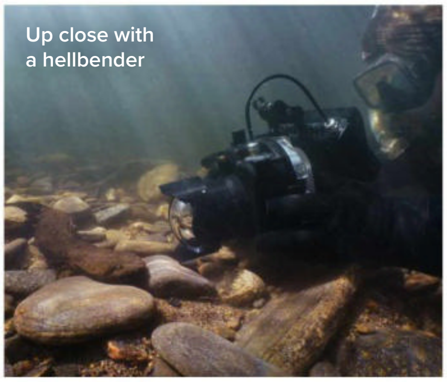
I spent a month filming hellbenders with a couple of friends in the mountains of North Carolina. Hellbenders are giant (60cm) aquatic salamanders with beady eyes, wide mouths and wrinkled skin, through which they absorb oxygen from the water. Observing the same individuals as they progressed through the breeding season made me feel a strong connection to them.

**What's been your most memorable experience underwater?**

Seeing a dense school of several hundred bright pink and electric blue rainbow shiners spawning in a tiny creek in Alabama. North America is home to many species of minnows that develop vibrant colours while spawning but, in my opinion, rainbow shiners are top of the list.

**Any particularly hairy experiences?**

During a brook trout shoot in Tennessee, I was sleeping in my campervan when I was suddenly awoken by a bear trying to break in. First, it crawled around on the roof. Then it started pushing and clawing at the windows. I pounded and yelled, but I couldn't scare it away until I started the vehicle and drove a few loops around the car park.



Up close with a hellbender

**Have you ever missed a great shot?**

Once, in a Florida spring, I was photographing a largemouth bass guarding a nest of eggs when I noticed a white object near the nest. Without thinking, I grabbed the object and moved it out of view. Later, I realised the object was an ancient Native American projectile point. It was a missed opportunity to capture a photo that would have told the unique story of an intersection between human and natural history.

**Which species would you like to shoot that continues to elude you?**

The bluehead shiner. It's a rare species of minnow that lives in swamps in the southern US. Males develop bright blue heads and large, showy fins during the spawning season.

**Which has been the most challenging shoot you've ever done?**

Shooting Southern Appalachian brook trout. First, there's the effort of hiking several miles up a mountain carrying an underwater camera system, wetsuit, water, food and other gear. Then comes lying in frigid water all day, hoping to get some good shots. Every couple of hours, you take a break to heat some water on a camping stove and pour it down your wetsuit to warm up. After all that, you hike back in the dark with all your gear.

**What is your favourite watery species?**

Chub nests are among the most fascinating and beautiful spectacles found in North American streams. The male collects rocks in his mouth and piles them into a large mound over his eggs to protect them from predators. The strategy works so well that many other species of colourful minnows have evolved to spawn in chub nests.

**What item would you not be without?**

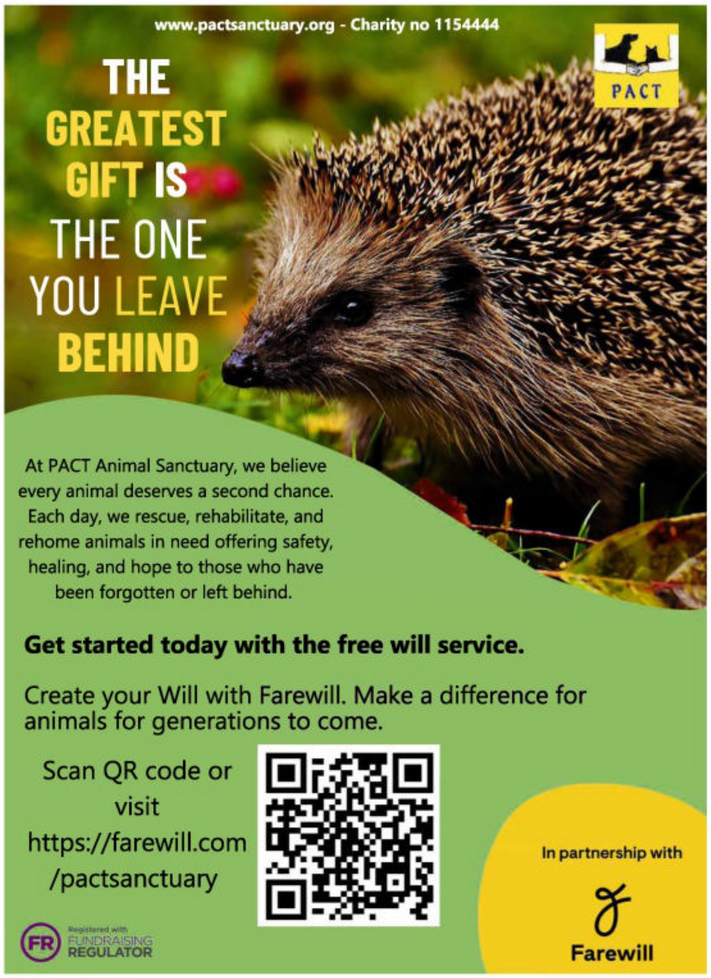
I love my Nikonos RS 13mm lens. It's a rare underwater fisheye lens made 30 years ago for film cameras. It still offers probably the best image quality of any underwater wide-angle lens ever produced. It doesn't normally work with modern cameras, but I modified it.

**Any top tips for budding photographers?**

Explore subjects that haven't been covered before or experiment with novel techniques. Focus on something you're passionate about – especially something close to home, as that can facilitate deep dives on subjects.

**Isaac Szabo is an underwater photographer. See more at isaacszabo.com**

PORTRAITS: ISAAC SZABO



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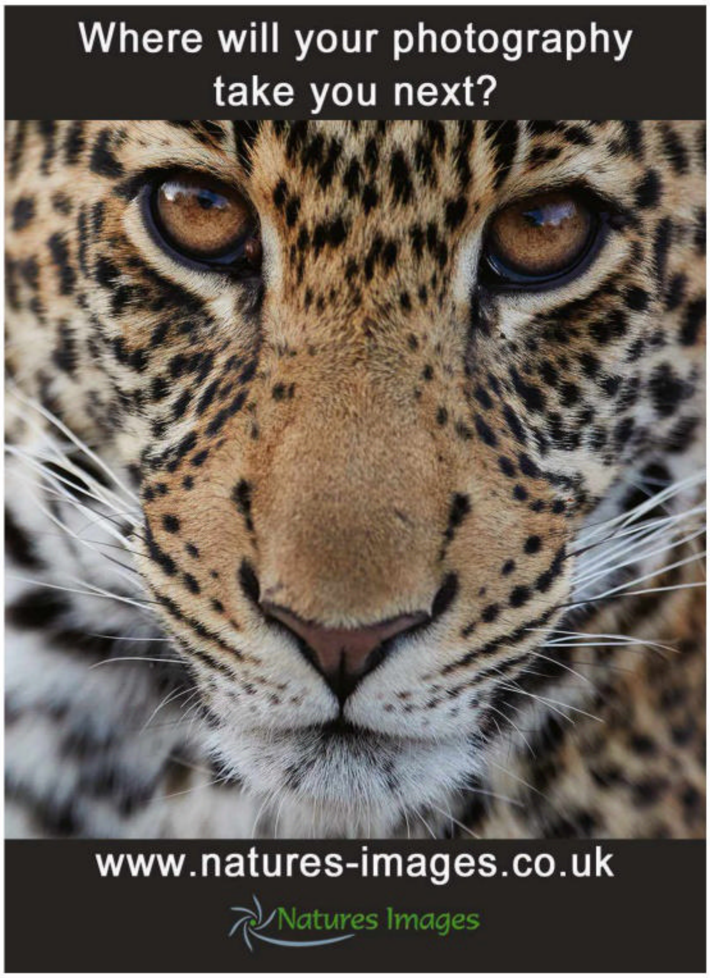

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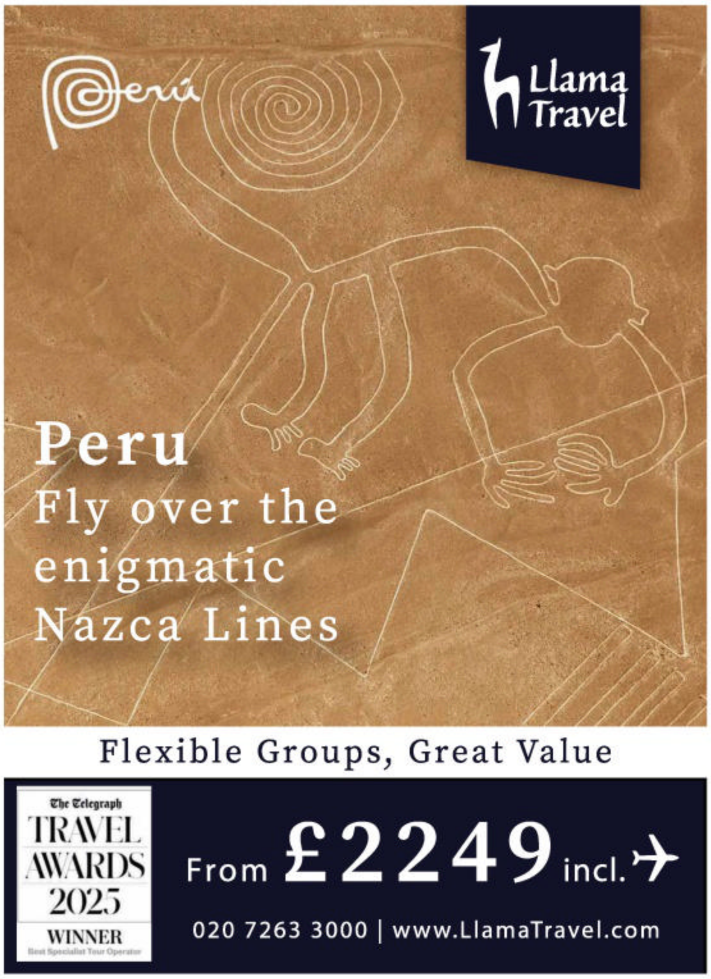

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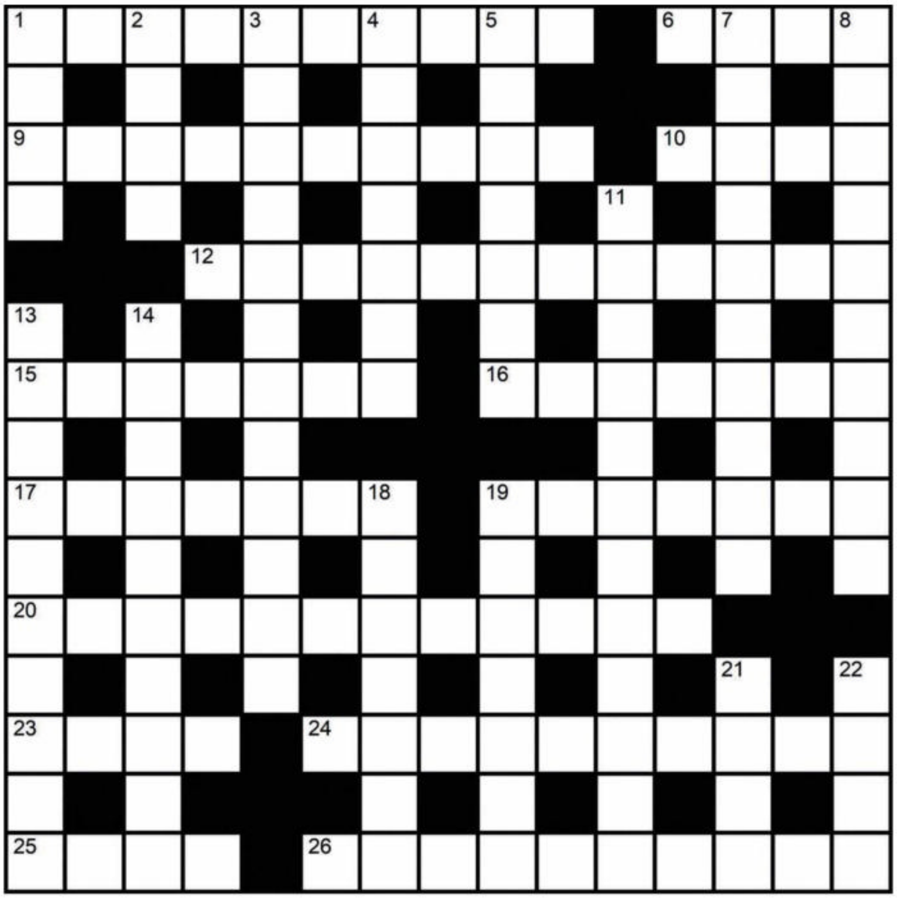
# wild PUZZLES

## The crossword



**ACROSS**
1 Large wading bird with long legs and bill, *Ciconia nigra* (5,5)
6 What an oologist studies (4)
9 Related to the pea family, like a lentil or vetch (10)
10 Small, belligerent songbird (4)
12 Fight-or-flight organ? (7,5)
15 Chirping insects that may be periodic (7)
16 ____ beetle, insect that secretes cantharidin (7)
17 Immature soy bean pod (7)
19 Of a leaf shape, tailed at one end (7)
20 Huge flying insect of North America, in the family Saturniidae (8,4)
23 US river of the southern midwest, notoriously polluted (4)
24 Species in the genus *Toxotes*, notable for its ability to shoot jets of water (10)
25 Lower limbs (4)
26 Fungal disease of trees in the family Lauraceae (6,4)

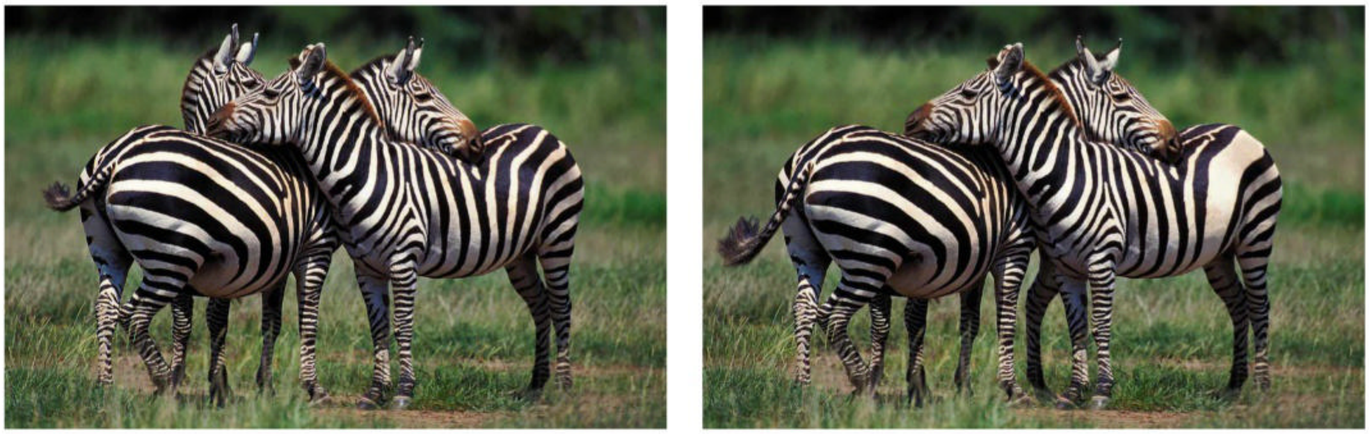
**DOWN**
1 Male elephant (4)
2 *Chlorella*, say, or kelp (4)
3 The world's largest lizard (6,6)
4 Burrows (7)
5 Plant in the genus *Rheum*, with edible fleshy stalks (7)
7 ____ blenny, Hawaiian fish that may grow up to 20cm (10)
8 Members of the freshwater fish genus *Ammocrypta* (4,6)
11 Concerning farming or farmland (12)
13 Small New World bird of prey (7,3)
14 Relieving an itch, perhaps using claws (10)
18 Country of East Africa, home to the Abyssinian hare and Soemmerring's gazelle (7)
19 Compound formerly used to protect insect collections (7)
21 Flightless bird of New Zealand (4)
22 Thrush-like songbird (4)

### October crossword

**Across:** 9 Preen, 10 Head louse, 11 Seriema, 12 Dyeweed, 13 Talon, 15 Bar, 16 Cub, 17 Toe, 19 Uruguay, 20 Elf, 23 Gnu, 24 Doe, 25 Union, 27 Oceanic, 29 Vulture, 32 Hawksbill, 33 Range

**Down:** 1 Apes, 2 Petrel, 3 Knee, 4 Rhea, 5 Sandgrouse, 6 Blue, 7 Queen bee, 8 Deodar, 13 Tit, 14 Nauru, 15 Blue Dacnis, 16 Coypu, 18 Eagle owl, 21 Fen, 22 Sloths, 26 Iguana, 28 Nest, 29 Vole, 30 Lark, 31 Eyes

## SPOT THE DIFFERENCE



Grant's zebra is the smallest subspecies of the plains zebra and forms social bonds through grooming. The zebras nibble each other on the neck and back using the tips of their teeth. Can you spot all five differences between the two images? Turn to page 94 to find the answers.

CROSSWORD SET BY RICHARD SMYTH. GRANT'S ZEBRAS: SLOWMOTIONGLI/GETTY

# Your LETTERS

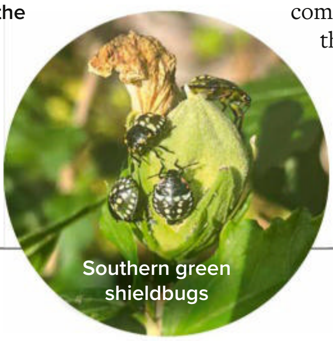
Burning heather moorland in Aberdeenshire

# Heated debate

JAMES FAIR’S ARTICLE ‘THE BURNING question on moors’ (October 2025) makes a good stab at presenting the views of both sides of this debate. But by presenting the issue as conservationists versus grouse moor owners, it creates the impression that all moorland is grouse moor and that every moorland owner illegally kills raptors, when, in fact, huge areas of moorland are not used in this way. I dislike intensely the overburnt grouse moors seen in some areas, but I also know that if large areas of heather are not controlled, they will eventually succumb to drastic wildfires. Some kind of firebreak, at the very least, is required to try to limit the damage. Some small areas can be mowed and ‘rewetting’ may create some narrow firebreaks, but the truth is that ling heather burns like fury and the only way to hope to limit it is by carefully controlled burning.
*Robin Noble, via email*

***James Fair replies:*** **You are right that large areas of heather present a fire risk. They aren’t, however, natural, but a result of deliberate engineering of moorlands to enable grouse shooting on the scale we see it today.**

It is a repulsive thought that in the 21st century, living creatures are artificially ‘preserved’ merely to serve as target practice for grouse shooting. Surely it is time for a positive use of precious land: wildlife walks, responsible tourism, birdwatching groups – things that are worthwhile rather than destructive.
*Lynette Webb, via email*


Southern green shieldbugs

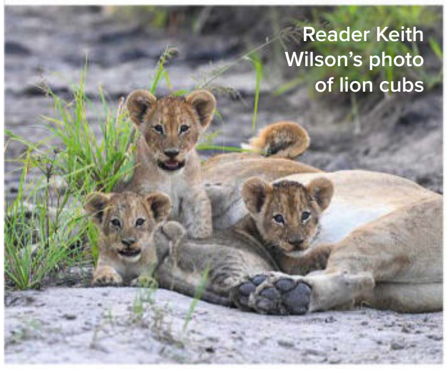
## Bug spot

I have never seen these before and have not been able to find out what they are. Are they ladybirds? They are on a hibiscus in my garden in London.
*Angela Wilkes, London*

**These are southern green shieldbugs, at roughly the third of five instar stages. Native to Africa, the species has made its way to the UK via southern Europe on food produce, and was first identified here in 2003. Adults are green, and easily confused with our native common green shieldbug.**

## Show us alternatives

Reading the article ‘Are new laws a threat to nature?’ (August 2025), I again find myself frustrated with the conservation community. I cannot see where the counterproposal is on how to meet building needs in the quantity and quality required. Significant numbers of people in government and the public believe that conservation causes are inhibitors to development. They are unlikely to change their view unless they see conservationists providing alternative, credible and helpful solutions. If they don’t, then the ball of ‘progress’ will continue to roll on over our nature-depleted environment.
*Gavin Watton, via email*

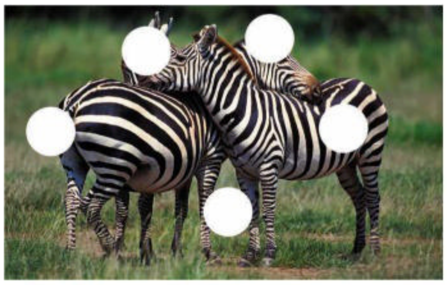

Reader Keith Wilson’s photo of lion cubs

## Family snaps

Your article on the BBC’s wonderful *Parenthood* series (August 2025) prompted me to look again at my photographs from a recent safari in Botswana. In this one (*above*), the female’s paw provides a point of reference for the size of her triplets.
*Keith Wilson, via email*

### CORRECTIONS

**Mike Dilger’s wildlife spectacles, October 2025**
The photo on the bottom left of page 34 is of a bateleur eagle, not a short-toed eagle as the caption stated
**Crossword, November 2025**
The clue for 21 across should have read “Beaver’s home” not “Otter’s home”


**Answers to Spot the Difference on page 93**

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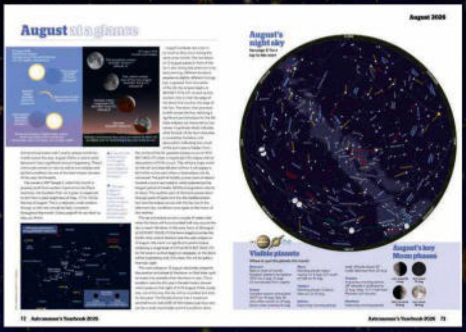
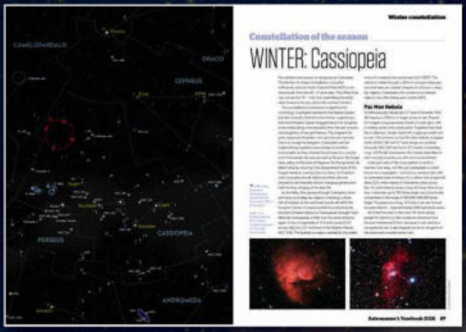
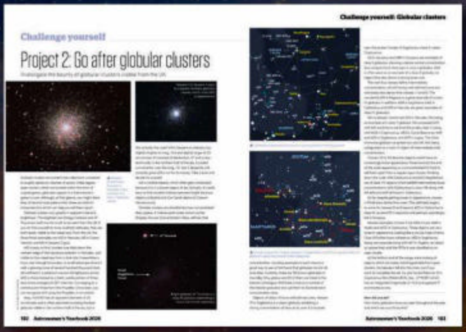

August at a glance
August 2026
August's night sky
Visible planets
August's key Moon phases

Our month-by-month guide and detailed star charts reveal what to look for and when, from stars and planets to Moon phases and more


Constellation of the season
WINTER: Cassiopeia
Winter constellation

Get to know the stand-out constellations of each season, as we highlight their brightest targets and how to best observe them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BBC wildlife

A koala in its leafy habitat of eucalyptus forest

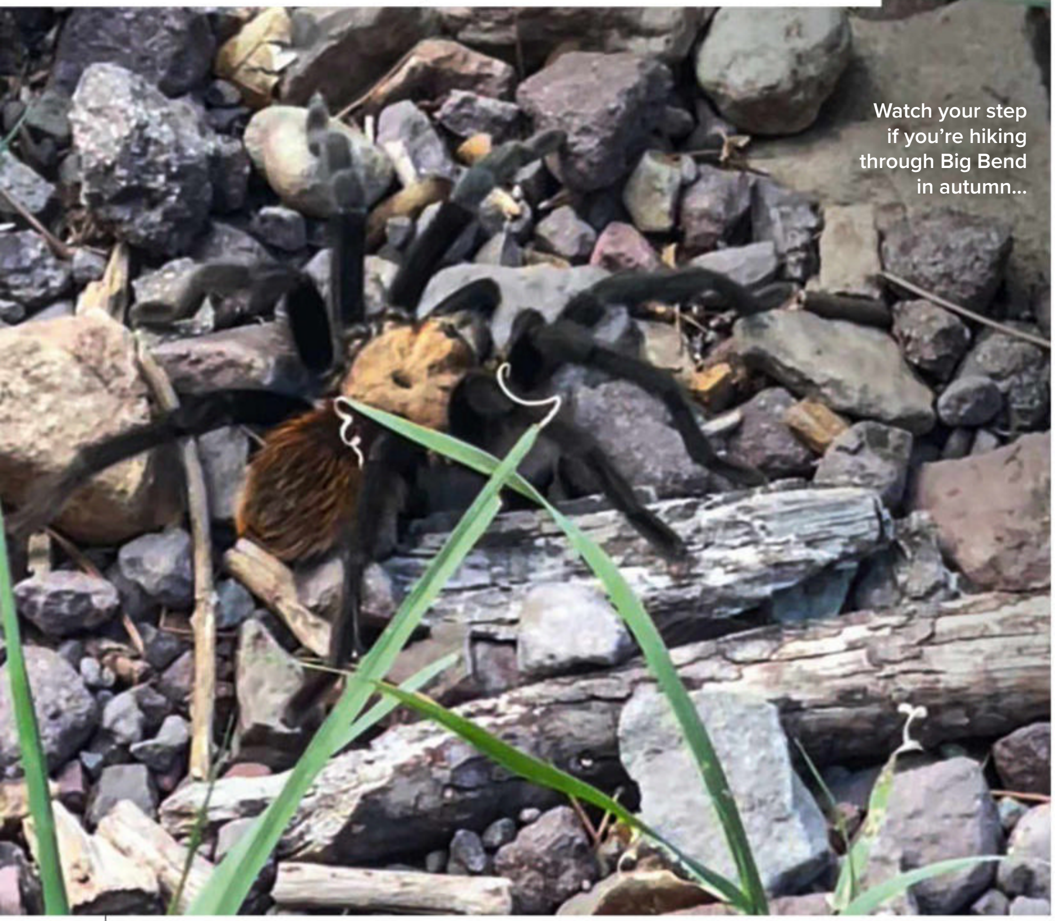
**NEXT MONTH**

# The koala paradox

ON SALE 11th DECEMBER

Arguably Australia's most iconic and engaging species, the koala is beloved by tourists and draws billions of dollars a year in tourism. It's also a conservation conundrum, overabundant in some regions and endangered in others. We look at the big picture of koala preservation in this vast country, and what's being done to safeguard the future of this magnificent marsupial.

KOALA: GERRY ELLIS/NATUREPL.COM



Watch your step if you're hiking through Big Bend in autumn...

# "There weren't just a few; there were hundreds"

## Texas brown tarantulas in the USA

**BY TAMARA MC**

I HAD COME TO BIG BEND National Park, Texas, for the solitude, the sweeping desert views and the hope of spotting a black bear. It was a six-hour drive from El Paso airport, a journey through vast swathes of West Texas, where the open road stretched endlessly ahead. By the time we got to the park, the sun was already starting to dip behind the rugged peaks of the Chisos Mountains. Eager to get in a hike before dark, we set off on the Lost Mine Trail, one of Big Bend's most popular hikes.

The trail, 7.5km out and back, winds through a rugged landscape of desert shrubs, sheer rock faces and towering peaks. Despite Big Bend's size – it spans more than 3,200km$^2$ – it's one of the least visited national parks in the USA and you can hike for hours without seeing a soul. It's what makes the park special – a wilderness where nature plays by its own rules.

I was admiring the scenery when I noticed something moving across the path ahead. At first, I thought it was a clump of desert scrub blowing in the wind, but more appeared – and they were large, dark and very much alive. One of them ran straight towards me, and had my friend not called out a warning, I might have stepped right on it. I froze as a tarantula scuttled past my boot. I looked around and realised we were surrounded. There weren't just a few here and there; there were hundreds, crawling across the trail, climbing over rocks and emerging from the desert floor like miniature, hairy explorers.

Now, I'm from Arizona. I've seen tarantulas before – but never like this. I had no idea that most of the tarantulas I'd previously encountered were likely males, because the females, as I quickly learned, rarely leave their burrows. These were Texas brown tarantulas (*Aphonopelma hentzi*), one of the largest spider species in North America, with 12cm legspans and hairy brown bodies built for survival in the desert.

These tarantulas are typically reclusive, living in burrows they either dig themselves or take over from rodents, using silk to line the entrance and detect movement. Despite their intimidating size, they are harmless to humans, preferring to retreat rather than bite. Even when they do bite, their venom is weaker than a bee sting.

The males around me were on a once-in-a-lifetime journey, having spent the past eight to 10 years underground before emerging for a final mission: to find a mate. Each autumn, Texas brown tarantulas cross Big Bend, covering miles in search of females. Their movements are slow and steady – no sudden jumps or lunges, despite what horror movies might have us believe.

I crouched down to watch them up close, fascinated by the way they moved, lifting each leg as if testing the ground before committing to their next step. Their hair isn't just for show; it helps them sense vibrations, detect threats and navigate their environment. The more I watched, the less frightening they became.

The females, however, weren't about to roll out a welcome mat. They remained in their burrows, waiting for potential suitors to come knocking – literally. A male will tap on the burrow entrance with his legs, hoping for an invitation. If the female is interested, she'll come out. If not, he may become her next meal.

The chosen males mate and continue their journey for a while, but ultimately their fate is sealed. Within a few weeks they die off, leaving a new generation of spiderlings. The females, meanwhile, can live for decades – up to 40 years – spending nearly their entire lives underground.

By the time we finished our hike, I had gone from startled to fascinated, marvelling at the patience and perseverance of these often maligned creatures, and buzzing from the unexpected spidery spectacle.

### ABOUT THE AUTHOR

**Tamara MC, animal lover and Lowell Thomas Travel Journalist of the Year (Bronze), is published in more than 90 outlets.**

TARANTULA: TAMARA MC

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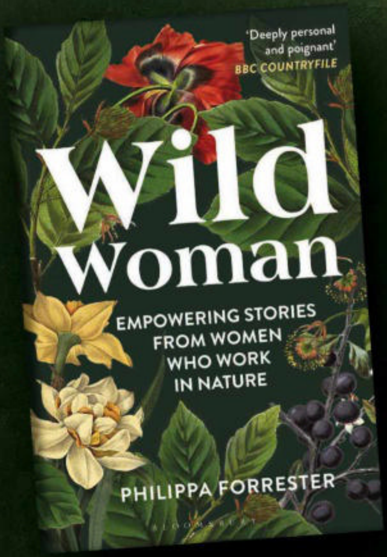
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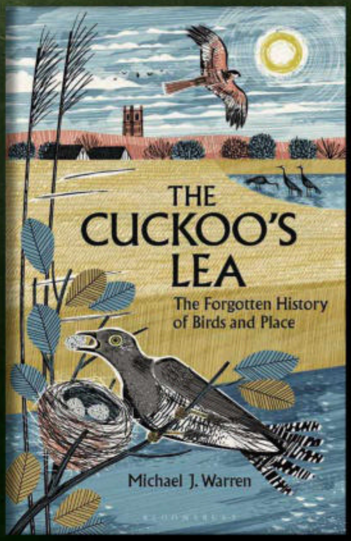
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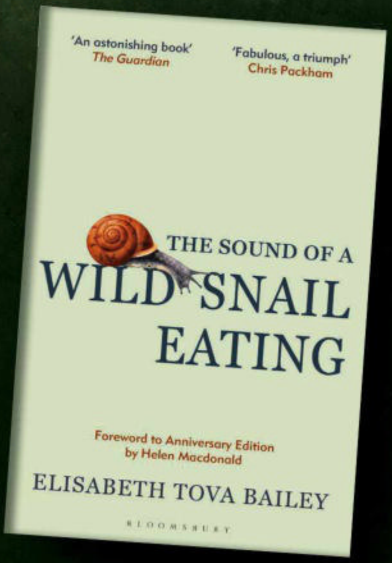
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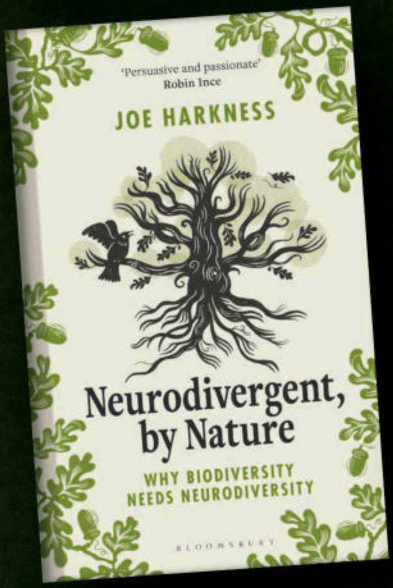
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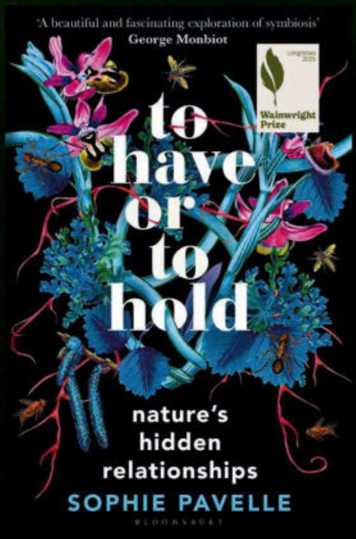
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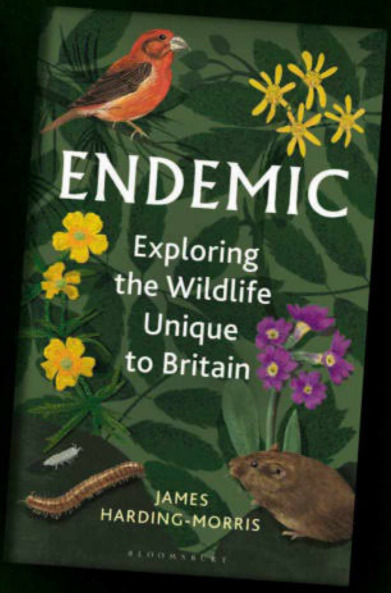
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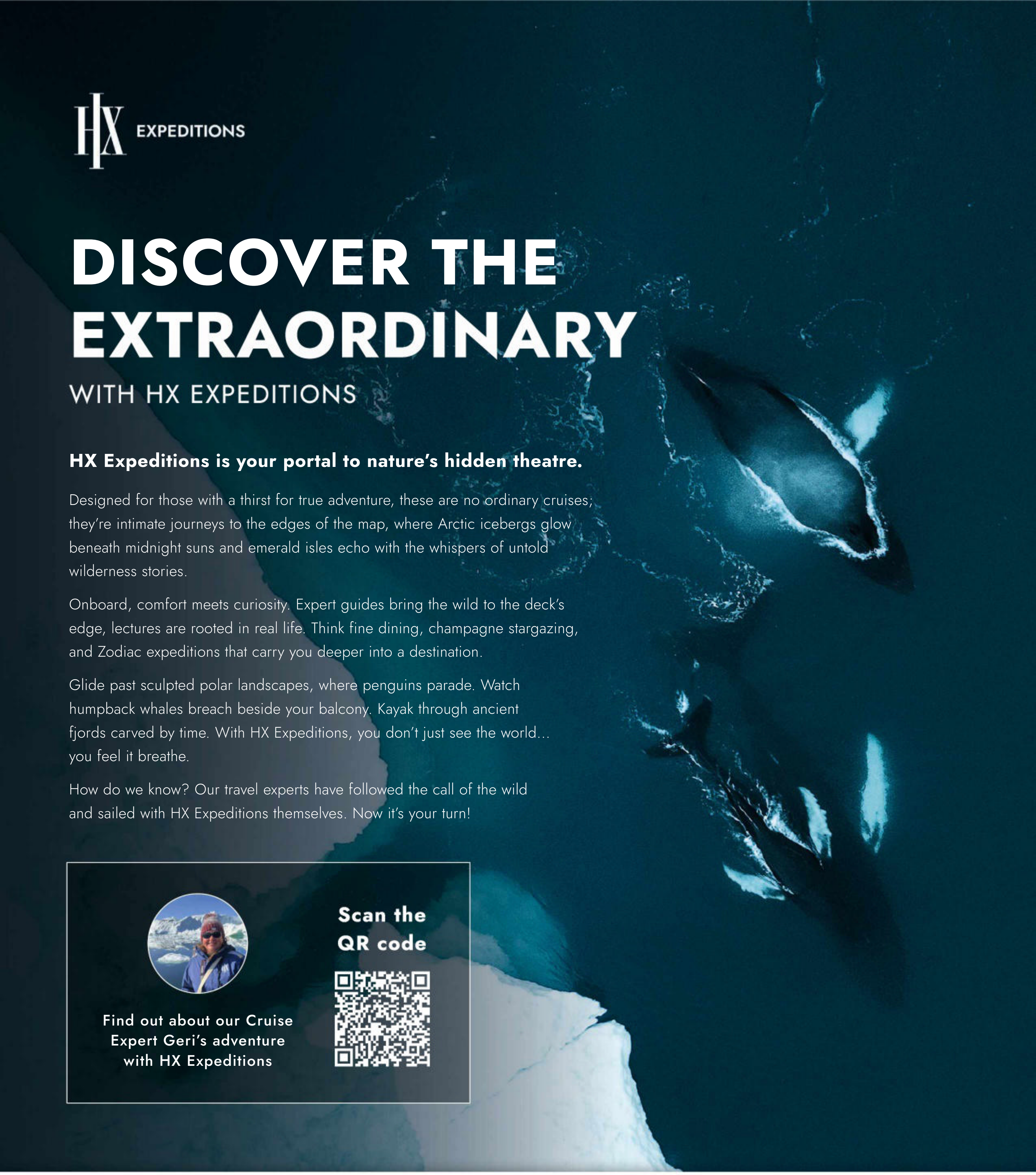

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# BBC wildlife
# CALENDAR 2026

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**COVER FIERY-THROATED HUMMINGBIRD**

Displaying all the colours of the rainbow, a fiery-throated hummingbird balances on an equally vivid crocosmia in the Cordillera Central, Costa Rica

**BROWN BEAR**

This male brown bear is on the alert in a meadow of common cottongrass in Finland, where the elusive mammal is the country's national animal

COVER: KLEIN & HUBERT/NATUREPL.COM; THIS PAGE: WILLI ROLFES/BIA/NATUREPL.COM

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BBC Wildlife

There are an estimated 8.7 million species on Earth, and our beautiful 2026 calendar celebrates this astonishing diversity of life. Each month transports you to a different corner of the natural world and showcases the species that call it home – from the technicolour dazzle of a European bee-eater darting over a wildflower meadow in southern Spain, to a gentoo penguin plummeting from an iceberg into chilly Antarctic waters. These breathtaking images not only capture the wonder of the wildlife that shares our planet, but also remind us that protecting it has never mattered more. Enjoy a wild 2026!

ADVERTISEMENT FEATURE

# Picture-perfect holidays

NaturesLens – the proud sponsor of this year's *BBC Wildlife* calendar – designs and leads small-group wildlife photography holidays for photographers craving authentic encounters with nature. Founded in the UK in 2014, the company's journeys span every continent – from the icy shores of Japan to the wild savannahs of Africa. Each trip is crafted by photographers for photographers, ensuring you're always in the right place, at the right time, for that perfect shot.

The NaturesLens portfolio now includes more than 35 photography holidays each year, carefully timed around seasonal wildlife spectacles – including puffins on Iceland's cliffs, jaguars in Brazil's wetlands and eagles in Hokkaido's frozen valleys in Japan. Every tour is led or co-led by experienced guides who understand both the technical and artistic sides of wildlife photography. Whether you're an experienced photographer or just starting out, you'll find the guidance relaxed, supportive and highly practical.

Groups are kept deliberately small – usually six or seven guests – and include single-occupancy accommodation as standard, with no single supplement. That means space, comfort and time to focus entirely on your photography. NaturesLens works only with trusted local partners who share the company's ethics, ensuring that every image is taken responsibly without disturbing wildlife or habitats.

People who have been on these holidays say that joining a NaturesLens trip feels like travelling with friends who understand their passion. Many guests return year after year, drawn by the combination of expert organisation, inspiring destinations, and the chance to create images that truly tell a story.

If the *BBC Wildlife* calendar inspires you to go beyond the page and into the wild, explore the NaturesLens collection of wildlife photography holidays – and see where your camera could take you next. Find out more at natureslens.co.uk.

PUI HANG MILES/NATURESLENS

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# January

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | | | 1<br>New Year's Day<br>Bank holiday<br>UK | 2<br>Bank holiday<br>Scotland | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15<br>*BBC Wildlife*<br>February issue on sale | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

**ALPINE IBEX**
A pair of horned Alpine ibexes stands majestic against the backdrop of Mount Watzmann in southern Germany's Berchtesgaden National Park

DIETER MEYRL/GETTY

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# February

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12<br>*BBC Wildlife*<br>March issue on sale | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | |

**EUROPEAN BEE-EATER**
In a riot of colour, this purposeful European bee-eater skims a flower meadow in the Sierra de Grazalema Natural Park in Cádiz, Spain

ANDRES M DOMINGUEZ/NATUREPL.COM

BBC Wildlife

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# March

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| 30 | 31 | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12<br>*BBC Wildlife*<br>Spring issue on sale | 13 | 14 | 15 |
| 16 | 17<br>St Patrick's Day<br>Bank holiday<br>Northern Ireland | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |

**BUTTERFLIES**
Morning dew glistens on the grass as a small heath (left) and a common blue butterfly explore their surroundings in Luzzara, Emilia-Romagna, Italy

ALBERTO GHIZZI PANIZZA/REDA/UNIVERSAL IMAGES GROUP/GETTY

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# April

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
|  |  | 1 | 2 | 3<br>Good Friday<br>Bank holiday<br>UK | 4 | 5 |
| 6<br>Easter Monday<br>Bank holiday<br>England, Wales and NI | 7 | 8 | 9<br>*BBC Wildlife*<br>April issue on sale | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 |  |  |  |

**CALIFORNIA SEALION**
A lone California sealion ripples its way along an underwater cavern in Espíritu Santo Island National Park, Baja California Sur, Mexico

HENLEY SPIERS/NATUREPL.COM

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# May

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 |
| 4<br>Early May bank holiday UK | 5 | 6 | 7<br>*BBC Wildlife* May issue on sale | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25<br>Spring bank holiday UK | 26 | 27 | 28 | 29 | 30 | 31 |

BBC Wildlife

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**AFRICAN ELEPHANTS**
The largest land animals on Earth, African elephants weigh about 6 tonnes and can grow up to 3.4m in height. Their huge ears allow them to radiate excess heat

NARVIKK/GETTY

# June

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4<br>*BBC Wildlife*<br>June issue on sale | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |  |  |  |  |  |

**RWENZORI THREE-HORNED CHAMELEON**
Sporting eye-catching yellows and greens, this male chameleon picks his way through the forested foothills of the Rwenzori Mountains, Uganda

ETIENNE LITTLEFAIR/NATUREPL.COM

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# July

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | | 1 | 2<br>*BBC Wildlife*<br>July issue on sale | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13<br>Battle of the Boyne bank holiday (substitute day) Northern Ireland | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30<br>*BBC Wildlife*<br>August issue on sale | 31 | | |

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**BENGAL TIGERS**
A female Bengal tiger and her cubs stroll along a forest track in Ranthambore National Park, Rajasthan, India – cubs stay with their mother for two to three years

ADITYA SINGH/GETTY

# August

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| 31<br>Summer bank holiday<br>England, Wales and NI | | | | | 1 | 2 |
| 3<br>Summer bank holiday<br>Scotland | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27<br>*BBC Wildlife*<br>September issue on sale | 28 | 29 | 30 |

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**WILLOW EMERALD DAMSELFLY**

The metallic green shades of the willow emerald damselfly blend into a meadow's herbaceous foliage in the green valleys of Mugello in Tuscany, Italy

LORENZO SHOUBRIDGE/NATUREPL.COM

# September

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24<br>*BBC Wildlife*<br>October issue on sale | 25 | 26 | 27 |
| 28 | 29 | 30 |  |  |  |  |

**RED-SHANKED DOUC LANGURS**

Known as the 'queen of primates', the striking red-shanked douc langur is seen here in the dense forests of Son Tra Peninsula in Da Nang, Vietnam

JETHUYNH/GETTY

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# October

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22<br>*BBC Wildlife*<br>November issue on sale | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |

**REEF FISH**
Coral reefs, here in Egypt's Red Sea, are vital ecosystems that support an estimated 25 per cent of all marine life. Over the past three decades the world has lost nearly half of these 'rainforests of the sea'

BRIAN KINNEY/ALAMY

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# November

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| 30<br>St Andrew's Day<br>Bank holiday<br>Scotland | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19<br>*BBC Wildlife*<br>December issue on sale | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |

**ARUBAN BURROWING OWL**
Endemic to the Caribbean island of Aruba, this burrowing owl, also known as the schoco, lives in burrows underground but hunts from a high perch

JEF PATTYN/NATUREPL.COM

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# December

| MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17<br>*BBC Wildlife*<br>January 2027 issue on sale | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25<br>Christmas Day<br>Bank holiday<br>UK | 26 | 27 |
| 28<br>Boxing Day bank holiday<br>(substitute day)<br>UK | 29 | 30 | 31 | | | |

**GENTOO PENGUIN**
A gentoo penguin dives off an iceberg into the cold Antarctic Ocean, revealing its brush tail, which sweeps from side to side as it walks

DAVID MERRON PHOTOGRAPHY/GETTY

BBC Wildlife

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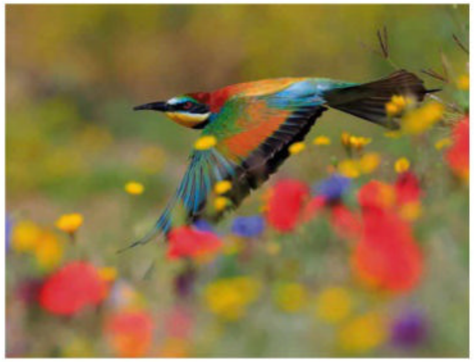

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